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personal, home, and community health

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PERSONAL, HOME, AND COMMUNITY HEALTH

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TO KAY AND NOBLE

Preface

The practical nurse's role in patient care becomes more important as the variety of and need for medical services increase. Ninety per cent of all persons under health care today are neither critically ill nor bedridden. A confident, competent practical nurse uses her knowledge and ability to the fullest capacity in simple nursing situations. She also assists the registered, professional nurse in more complex nursing situations. To fulfill these responsibilities the practical nurse needs a sound background of broad information on health and health-care organizations.

This book has been written to focus the attention of the student practical nurse on good health habits for herself, good hygiene practices in her home, and the multiplicity of persons and organizations having special responsibilities in acting on health problems of the individual and the community. An understanding application of the multiple disciplines involved in all aspects of health is our objective here.

Those aspects of health are emphasized that will help people build resistance and avoid serious illnesses. They concur with today's emphasis on preventive medicine. The nurse should understand what can be done and what is reasonable and practical to expect of people. For example, in the matter of weight control, exercise is more changeable than diet. The nurse should know what health practices she can help others to attain and what will motivate people to make the effort to improve their health.

In this book, the authors strive to bridge the gap between lay language and technical language. To help the student practical nurse acquire a medical vocabulary, terms are explained when they are introduced. It is hoped that this book will be useful to persons without previous technical training.

Part I, "Personal Health and Hygiene," is directed toward encouraging the student practical nurse to establish a sound health program for herself. Pertinent information is given regarding personal grooming; daily health routines; good posture and care of the feet; feminine hygiene; dental, eye, and ear health; and mental health. The nurse needs to apply her knowledge of health and to be an example of good physical and mental health for her patients. A sick person cannot assist another sick person. It takes a well person to help a sick person.

The threat to health and society created by alcoholism and drug addiction are discussed in Chapter 7, "Stimulants and Narcotics." These are personal health problems which require community action.

Chapter 9, "Health Maintenance and Your Personal Physician," should help the student practical nurse to act calmly in her own home. If she chooses a doctor before illness strikes and if she and her family have thorough physical examinations at necessary intervals, emergency situations are less likely to occur.

It is assumed that elsewhere in the school curriculum the student practical nurse will study the structure of the body and specific illnesses. These are omitted from the discussion of personal health, where attention is centered on the details of health care and the establishment of daily routines.

Part II, "Relationship Between Sanitation and Disease," provides a scientific base for the student to understand the causes of infectious disease and to learn such essential nursing techniques as disinfection, isolation, and sterilization. The bedside nurse must do more than memorize rules; she must be able to apply knowledge to each situation. Chapters 10 and 11 on elementary microbiology relate to other parts of the book but may be omitted if the study of microbiology is included elsewhere in the nursing curriculum.

In Part III, "Home Hygiene," the scientific principles of health care are applied to the home. To understand how housing influences family and community health the nurse needs a broad appreciation of the multiple housing standards and the housing regulatory bodies. One can improve housing with good ventilation and basic cleanliness. A home which looks clean is likely to be clean. The nurse should be able to advise commonsense measures without sounding like an alarmist. Neatness can be overdone, but household hygiene merits more serious consideration than it has received in the past. Good health is promoted by routine house cleaning, thorough laundering of clothes and household items, proper storage of food, sanitary dishwashing methods, and careful handling of garbage. Indifference toward cleanliness and home repairs can result in uncontrolled household pests and accidents in the home. The nurse who achieves sanitation in her home will be a more effective teacher of sanitation for the patient and his family.

Part IV, "Community Health and Hygiene," describes the various health organizations and how they work toward solving community health problems. The brief account of sanitary practices of earlier times in Chapter 17, "Beginnings of Community Health," will enable the student practical nurse to appreciate more fully current public health practices. The organization and activities of government regarding public health matters are viewed in Chapter 18, "National Health Resources"; in Chapter 19, "State Health Department"; and in Chapter 20, "Local Health Department." The role of voluntary agencies is discussed in Chapter 22.

Chapter 21, "Environmental Sanitation," contains factual information on such community health problems as air and water pollution, slum housing, water supply, and waste disposal. The informed practical nurse can be an effective force in helping to carry out public health measures. Passing ordinances does not guarantee community sanitation. When citizens willingly cooperate with the health department, progress is possible. The practical nurse who wholeheartedly supports public health regulations can help to convince her neighbors to do the same.

A plateau has been reached in many areas of health. Medical science seems to have advanced more rapidly than the ability of people to use these advances. Yet new approaches are coming—with a great potential.

The federal government's attempt to eradicate poverty is also an assault on preventable disease, for the fifth of our nation's people who live in poverty have a high incidence of disease and disability. Efforts to help these Americans include efforts to improve health and reduce disease. Medical care is to be extended to the very young as well as to the elderly. Health education directed toward schoolchildren is being re-evaluated.

The practical nurse who has a thorough understanding of basic good health habits should be able to communicate to others in lay language and to inspire people to want to live in a healthful manner.

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D. H.
N. B. H.

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PART I

Personal Health and Hygiene

EDUCATION &
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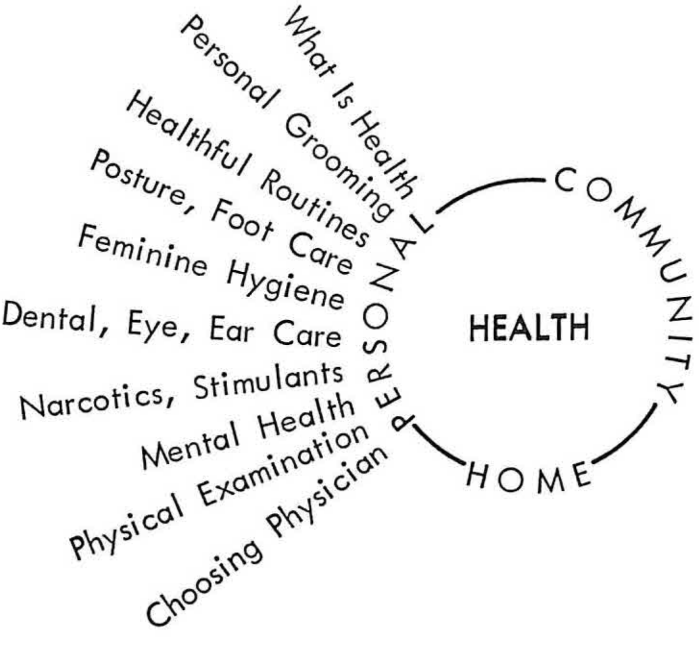

Figure 1–1. Essential phases of personal health.

Chapter 1

THE PRACTICAL NURSE AND GOOD HEALTH

Good health is a priceless attribute desired by everyone, for without good health life can be difficult and meaningless. With good health the full potential of a happy and rewarding life can be realized.

You, the student nurse, are one of the fortunate people. You have good health, or you would not be able to enter the field of nursing.

Now, what is good health? How does one maintain good health? How can the practical nurse help members of her family, her patients, and her fellow citizens to improve their health? What is the role of health today?

These are some of the questions to answer if you are to assume the role of a practical nurse who is a qualified, dependable member of the health team. The practical nurse is in many situations, as far as bedside nursing care is concerned, "nurse" to the hospital patient, to her family members, and to her friends and acquaintances. A basic understanding of the role of health and of the issues involved in improving health practices is essential for the practical nurse.

In particular, the practical nurse needs to understand how these problems relate to her and to her community as health care becomes more and more community centered. The increase in urban population has intensified the problem of community health; the practical nurse must be well trained in many areas of health sciences if she is to cope with the problems she will face.

WHO Defines Health

The World Health Organization's definition of good health is generally accepted: "Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." Because this definition was formulated in 1946, it is reasonable that twenty years later, the definition requires expanding.

Health Means Different Things to Different People

Broad terms are interpreted differently because people are living and thinking differently. Thus a broad, general definition of health will be interpreted in many ways. Consider the influence of age on the meaning of health. Good health means one thing to a lively, sports-minded teen-ager; another thing to the mature woman with silvery hair and a flock of grandchildren; and still another thing to the dignified man in his seventies.

Various members of the health team do not agree on health definitions because each one is doing something different for the patient. Diverse views of health will be expressed by the nurse, the doctor, the dietician, the physical therapist, or the social worker.

Health Care Is Multidisciplinary

The current approach to health is through all disciplines, for family health care is no longer the responsibility of one doctor and his nurse. Now many people are involved in caring for one person or family. The list of people may include the general practitioner, medical specialist, dentist, oculist, podiatrist, physical therapist, occupational therapist, dietician, social worker, welfare worker, sanitarian, and many others (Figure 1–2).

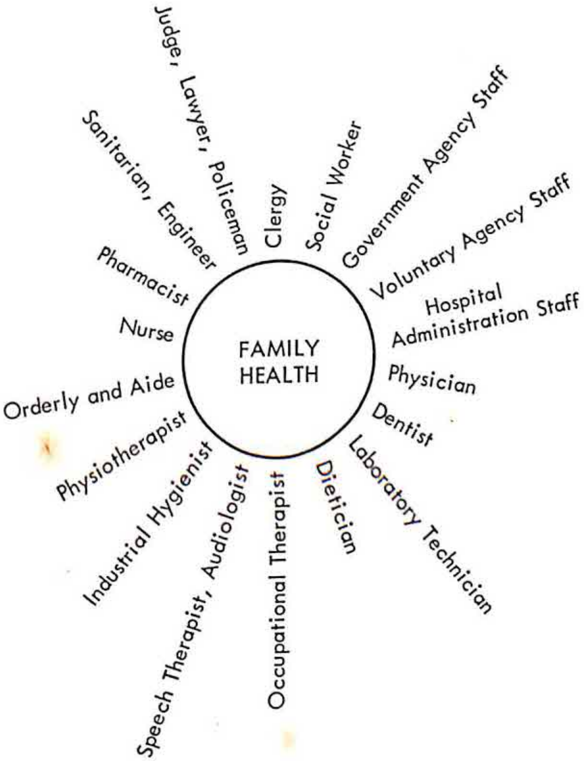

Figure 1–2. Multidisciplinary aspect of health.

When all disciplines combine their efforts, the patient and the community receive the maximum benefits. To facilitate this each member of a health specialty needs to understand and respect the contributions of the others. Hence, the competent practical nurse is one who expertly performs her own duties and who understands enough of the others' roles to support their efforts.

During your term as a student practical nurse, strive to learn as much as possible about the work of others in the health field. The study of community health necessitates a brief introduction to many health workers. You need not be an authority on their work, but an understanding of their goals will enable you to give them generous support and to offer genuine reassurance to your patient.

Changing Role of Health

Health is now the *right* of everyone. Even twenty years ago, each individual had the right to *get* the health services. If you had the money to pay for the necessary operation, you were entitled to have it, but it was considered your responsibility, your right to earn the money. Today, health is the vested privilege, the just claim of every person.

While a student practical nurse, your patients may include people who cannot afford to pay their hospital bills. These people are termed the "medically indigent," and your community has plans to provide for their health care although the extent of the health care provided will vary with the community.

One direct outgrowth of this philosophy, "Health is for everyone," is the increased national expenditure for health and medical care. In 1935, the national expenditure for health and medical care was $3.1 billion. In 1964, this had increased to $35.4 billion. The percentage of the consumer dollar spent for medical care in 1964 was 6.8 per cent; in 1946–1950, this was 4.8 per cent.[1]

Another outgrowth of the philosophy that health is for everyone is the medicare bill passed by congress in 1965.

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[1] *U.S. News and World Report,* February 1, 1965, based on figures from U.S. Department of Commerce.

Preventive Medicine Increasing

Physicians are emphasizing preventive medicine, and the number of specialists in preventive medicine is increasing. The nurse who is thoroughly acquainted with good health practices and modern methods can be a tremendous influence on the effectiveness of preventive medicine.

Heredity Is a Factor in Health

We work at controlling the environment, yet we do not completely disregard heredity factors. Our study of personal and community health will be directed mainly toward controlling environment, because we can shape our environment, whereas heredity is established.

Hereditary factors are important in such diseases as mental retardation, cancer, diabetes, and congenital heart disease, to mention only a few, and may be contrasted to birth defects resulting from fetal environment exposures such as German measles or other virus diseases of the mother, chemical exposure (thalidomide), and exposure to x-ray or other forms of radiation.

Apply Knowledge of Health

The nurse needs to apply her knowledge of health, and she should center the details of health upon herself. It is not enough just to know the four basic food groups. The competent nurse uses her knowledge by eating a well-balanced diet. She practices good posture, she avoids colds, she prevents constipation, always starting with herself.

The nurse is a health teacher. Actually, teaching health is one form of application because hospital functions have changed, and it is now important not only to help the patient to get well but to teach him how to stay well. The bedside nurse interprets the rules of healthful living to the patient.

But before you can teach health to others, you need to understand and apply the health principles to yourself. This book will be directed toward helping you practice healthful living.

Good Health Benefits the Nurse

The nurse with good health benefits directly. Because she is exposed to disease-producing microorganisms, she needs to maintain her resistance with good general health. Nursing entails physical exertion, often hard work, and a nurse has to have the stamina to perform her tasks. The healthy nurse is efficient, hence the energy expended produces optimum good for her patient.

Good health contributes toward a pleasant disposition, enabling the nurse to get along well with her patients and her co-workers. Because she feels good and enjoys her work, her personal appearance is favorably influenced. Health and happiness are the real basis for beauty. To the bedfast patient, a well-groomed, healthy nurse functioning with assurance, empathy, and skill is truly beautiful. The patient gains reassurance and self-confidence.

Keep Your Perspective

As a nurse, you should be able to take care of your health without letting it become your reason for living, for it is possible to become obsessed with health care and to let it overshadow everything else in one's life.

You need enough knowledge to know when to seek professional help, which need not be for every minor or fleeting pain.

Health Appraisal

Health appraisal, unless following a set evaluation pattern, will always be done along the lines of the given individual's own working definition of health.

Health Appraisal Guide

(Ten points maximum for each of the following questions)

1. General alertness and responsiveness to surroundings and other people.
2. Hair: well groomed, shiny, clean.
3. Skin: texture smooth, free from blemishes, pigmentation, wrinkles, scarring.
4. Eyes: clear, bright, alert with no frown lines in forehead or face.
5. Mouth: pleasant smile, teeth clean and regular, breath clean, breathing through nose.
6. Hands: skin smooth and moist, nails clean and well groomed.
7. Feet: alignment straight forward, ankles straight, arches normal, good weight distribution.
8. Good standing, walking, and sitting posture:

   Stand with head high, chin and shoulders level, arms relaxed and free, chest forward, back straight, abdomen flat, weight well distributed.

   Sit with graceful posture—head, neck, and body as in standing; back and lower spine against chair; hands relaxed in lap; knees touching, feet parallel and crossed over each other.

   Walk with good rhythm and easy, graceful carriage, toes forward, with controlled, resilient steps.
9. Proper shoes and clothing for adequate protection, appropriate appearance, and full functional capacity, particularly shoes that conform to the shape of the foot with adequate sole and heel width.
10. Weight appropriate to age, height, build, and activities.

Measurements of Healthful Living As to Proper:

1. Sleep.
2. Rest.
3. Exercise.
4. Food intake.
5. Personal Habits.
6. Medical attention.
7. Recreation.
8. Lighting, heating, and ventilation.
9. Alcohol, tobacco, and drug use.
10. Philosophy of life relative to self and others; ultimate goals or meaningfulness of life.

Chapter 2

PERSONAL GROOMING

A fastidiously well-groomed nurse, radiating good health, creates a sense of security in her patient, who is encouraged to accept assistance and counsel from a nurse whose appearance reflects self-confidence and competence. The nurse's grooming is consistently scrutinized and because she has close contact with people, any hint of body odor is immediately detected.

You may compare the nurse to the professional model who earns her living by posing for photographs. The model knows that a chic, immaculate appearance is essential to her career and recognizes that she must expend time, energy, and a little money if she is to present to the public a picture of style and beauty. She dare not habitually lose sleep, or the camera will record the fact. Similarly, the bedside nurse needs to look as though she practices the principles of clean, healthful living if she is to win the confidence of her patient; like the model, she must be willing to devote time, energy, and a little money to look her best. It takes time to polish white shoes, to launder white uniforms, to manicure fingernails, and to bathe daily. These and other routines are necessary elements for success in the nursing field (see Figure 2–1).

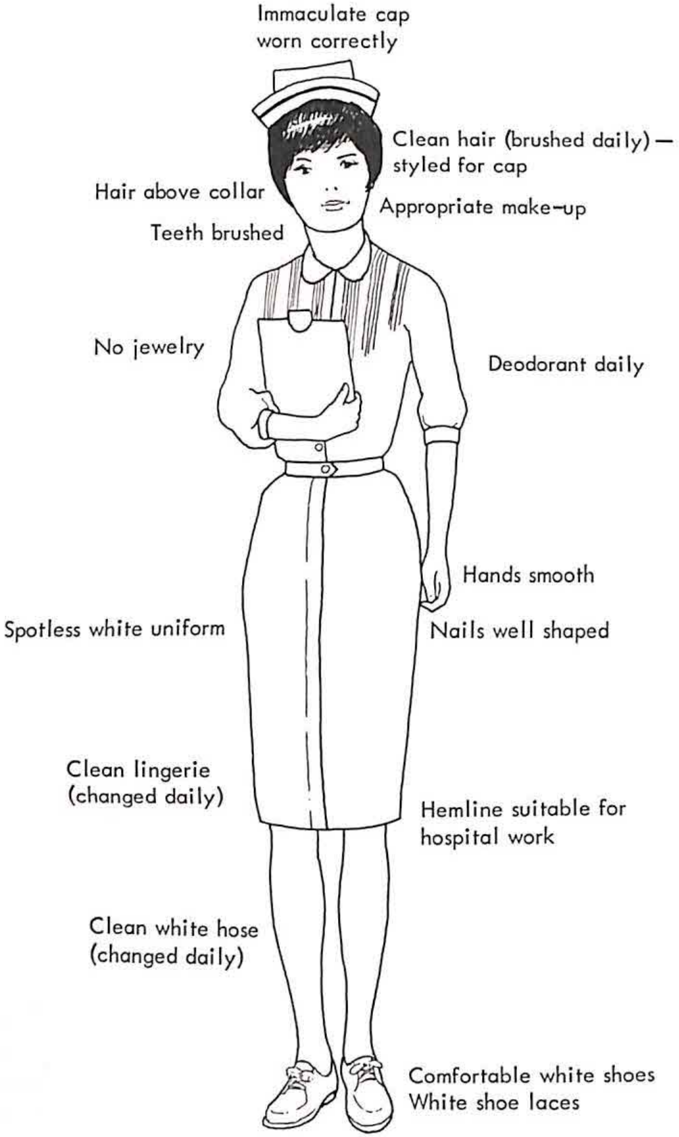


Figure 2–1. The well-groomed nurse.

A Clean Skin

A clean skin is a basic goal of health and beauty routines. Even if the skin does not look dirty, the daily bath is essential to remove the accumulation of waste products and to destroy perspiration odors. In addition, the tub bath of lukewarm water soothes and relaxes, giving a sense of well-being. The shower, especially the cold shower, stimulates circulation.

For best results, bathe in soft water or add bath salts to hard water. Using soaps in hard water may cause dryness and itching. Avoid massaging the soap into the skin and use plenty of water in order to rise away all soap.

Individual choices of soap will vary. Some people require a more mild soap than others. Most people find that the detergents remove too many of the natural skin oils for comfort. Medicated soaps should be used only upon the advice of the physician. Certain soaps are more effective than others in reducing the number of bacteria on the skin. The nurse should avoid highly perfumed soaps.

People with dry skin may prefer nonsoap cleansers which leave the skin with its natural acidity, rather than suffer the drying effect of the alkalies in soaps. (A dermatologist will recommend specific products.)

PERSPIRATION

Perspiration is the end product of a natural body function. It is the odor, not the perspiration, that can be prevented. Perspiration is water containing dissolved body wastes and is discharged by the sweat glands through the pores. This elimination of body wastes through the skin also helps to control body temperature. When a person is warm, he sweats; more heat (energy) is required to evaporate moisture from the body, and the body cools.

Everyone perspires constantly, both in summer and in winter. Temperature and activity alter the amount of perspiration, which may vary from 1 quart to 2 quarts daily. In cold weather the body production of urine increases and that of perspiration decreases. The amount of perspiration is increased by warm weather, physical activity, fatigue, excitement, nervous strain, tension, heavy or tight clothing, pain, certain disease conditions, and some drugs.

Profuse sweating in hot weather means that the body loses sodium chloride and other salts in large amounts. Loss of sodium chloride causes weakness, nausea, vomiting, pallor, and malaise. Under conditions producing profuse sweating, an increased salt intake is needed.

Perspiration is virtually odorless when it reaches the skin, but objectionable odor develops when bacteria cause fats and oils to be broken down into odoriferous compounds. These bacteria are always present on the skin, although washing with soap and water will reduce their number. After a few hours, the bacteria reproduce, and their number returns to normal. A combination of perspiration, dirt, and skin oil provides the best media for bacteria growth, hence perspiration odor increases under these conditions. Underarm hair increases retention of the odor of perspiration by acting as a collecting site for secretions. There are also more oil-secreting glands in the underarm area that provide material to be broken down by bacteria into odor-producing compounds.

Perspiration is a special problem in closed-in areas of the body, where air cannot circulate and the moisture does not evaporate promply, therefore unpleasant odors occur most often under the arms, between the legs, and between the toes. Odor varies in intensity and character in different people. Even during periods when glandular activity is at its peak—from adolescence to middle age—there is considerable variation in rate of perspiration between one person and another. A person may offend with perspiration odor and not realize it because the sense of smell fatigues and he becomes accustomed to the odor and does not detect it.

The nurse should carefully observe four simple procedures which help to prevent the odor of perspiration: wash or bathe daily; remove underarm hair; change clothing frequently; and use a deodorant.

DEODORANTS

Everyone needs a deodorant except possibly children and old people. (Perspiration flow decreases with age.) Some people cling to the old-fashioned idea that soap and water is all that is needed, but the nurse who has constant close contact with others should recognize that a deodorant is a necessary grooming aid.

Simple deodorants stop only the odor of perspiration. Washing with soap and water will remove the perspiration odor that is present and will temporarily reduce the number of odor-producing bacteria. If a chemical is then applied to the skin that will inactivate the bacteria and curb their growth, the odor does not form as soon. Cream, liquid, and lotion deodorants contain such antibacterial substances and are a safe and effective solution to the odor problem for many people.

Antiperspirant deodorants check perspiration flow as well as odor. These more complex products are classified as both drugs and cosmetics because, in checking perspiration, the skin structure is altered. Their success is questionable. Scientists say that a complete check in the flow of perspiration is impossible, although users describe the products as partially effective. Certainly the nurse should not rely on one application to give twenty-four-hour protection. Each person's needs vary with the type of life he lives. An active person under pressure experiences a perspiration flow which an antiperspirant cannot completely control.

Because antiperspirants cause more unfavorable reactions than most cosmetics, users should adhere carefully to certain precautions. Do not apply an antiperspirant where the skin is broken, and avoid using it immediately after shaving under the arms. Unusual redness and itching warn that the skin is irritated and that the use of the product should be discontinued. Substitute a simple deodorant.

Cosmetics and Beauty Aids

Wisely selected cosmetics applied with moderation can accentuate natural coloring and increase attractiveness. Some women find that white uniforms are not as flattering to them as street clothes, but carefully applied makeup may compensate and supply the needed color. The patient may be cheered by the sight of a bright face; however, excessive use of lipstick, rouge, mascara, and certain eye cosmetics are in poor taste in the hospital.

The skin tends to dry out as one gets older, a condition aggravated by dry air circulating in buildings in the wintertime. Regular use of lubricating or emollient lotions and cream may retard unduly fast evaporation of moisture from the skin. The so-called moisture creams or lotions act on this principle. Lanolin, a softening fat, is frequently the main ingredient; albolene is also a fat used in cleansing creams and is an ingredient that liquiefies easily and removes surface dirt. At night and before applying fresh makeup, all cosmetics should be removed carefully by cleansing the face with mild soap or cleansing cream.

Heredity influences the skin's color, texture, and rate of aging; however, good diet, proper skin care, and proper use of cosmetics will help the skin to look its best at any age. The skin also needs protection against excessive exposure to the sun.

It has been said that the average person spends more time and money on care of the skin, hair, and nails than on medical and health services. An attractive appearance is an asset, but the nurse should remember that the appearance of her skin and hair depends more on general health than on cosmetics.

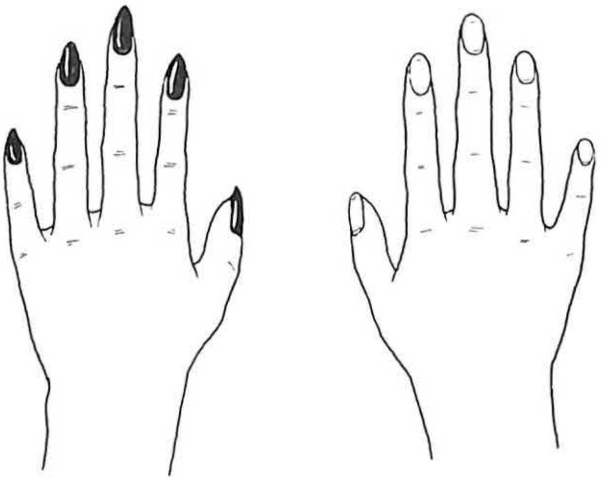
Sunbathing

Sunshine and fresh air, taken in small amounts, can be healthful, beautifying, and enjoyable but too much sun and wind may be harmful to the skin, eyes, and hair. Overexposure to the sun will cause the skin to age and become dry, wrinkled, and leathery.

Sunlight can also make the hair brittle, discolored, and unmanageable for months. The eyes, too, always need protection from the sun, because they cannot build up immunity to it and are thus vulnerable to injury. Too much sunlight and ultraviolet light may cause cancer of the skin. However, for those people who are not sensitive to the sun, the normal process of gradual tanning is recommended. To avoid sunburning time your sunbaths, beginning with no more than fifteen minutes in the sun, then each day lengthen the exposure by fifteen minutes. A protective suntan lotion can help to keep burning at a minimum. Read the label to learn if the prepartion contains a chemical which screens out most of the burning rays of the sun. Among the best chemicals are paraminobenzoic acid and its esters, the salicylates, and digalloyl trioleate compounds. For long periods in the sun always use a sunscreening preparation and apply it at least every two hours, after each swim, or whenever the protecting film may have rubbed off. Remember, no product will protect against sunburn indefinitely; reapplication is always necessary. Commonsense precautions will enable one to enjoy vacations and outdoor summer living.

HAND CARE

Well-cared-for hands attract admiration and approval (See Figure 2–2). The nurse's hands can be attractive with daily attention and care, and a nurse needs well-groomed hands because she is working with patients, touching and handling people. Because she has her hands in water frequently, keeping her hands soft will require continuous effort. Everyone should have clean hands, because dirty skin and fingernails harbor bacteria. The nurse working with sick people must be particularly careful not to transmit bacteria. You will undoubtedly have learned by now the correct hand-washing procedure, but a few guides for hand care are appropriate. When washing the hands, rinse off all soap, and never allow detergents to dry on the hands. After thorough and careful drying, apply hand lotion or cream to the



Avoid: long, pointed nails and bright polish.

Do: shape nails with emery board. Push back cuticle gently when drying hands.

Figure 2–2. Nail care is important.

hands and massage them. The base of the lotion may be glycerin or lanolin, ingredients which tend to retain moisture and to prevent evaporation of moisture from the skin. Hand lotions do not nourish the skin, but they prevent excess dryness and chapping. Always shield the hands from strong solutions by wearing rubber gloves, and always wear gloves in cold weather. Don protective gloves before beginning a task such as gardening or waxing furniture.

Keep the cuticle soft and unbroken. Push back the cuticle with the towel when drying the hands. Hangnails are formed as the cuticle attaches itself to the nail. The skin tears as the nail grows. Avoid using sharp objects on the cuticle. File the nails to a serviceable and safe length, for a nurse cannot have long fingernails. (Bright nail polish must be avoided, too.) Shape the nails by using an emery board with flat surface at right angles to the nail. It is wise to carry an emery board in your purse. Protect the nail tips. Do not pry with the nails and never pick at them. Use an orangewood stick to clean gently under the nails. The practice of nail-biting cannot be too strongly condemned for the nurse. Nail health, like that of the hair and skin, depends upon general health. Peeling, splitting, or breaking can be caused by poor diet. Illness or injury can provoke pitted or bumpy nails. White spots may be caused by injury.

Care of the Hair

A trim, attractive coiffure is one womanly asset that every nurse can acquire, for shiny, glossy hair is the product of good health and good grooming. Possibly no other physical characteristic more truly reflects the state of general health. Dry, lusterless, or thinning hair may be caused by poor diet, chronic fatigue, or illness. No magic prepartions can substitute for good health. Yet cleanliness, proper care, and a wisely chosen hair style will help to make one's hair look as well as possible.

Thinning hair has always been associated with the aging process, however there has been a sharp increase in otherwise healthy women, under forty, reporting severe loss of hair. Recognized causes for loss of hair include hereditary factors, certain medicines, illness accompanied by high fever, and pregnancy. Other possible causes of hair loss (sometimes temporary) are excessive oiliness; excessive combing, teasing, or brushing; improper use of home permanents; brush hair rollers; tightly drawn hairstyles, such as the pony tail; nylon hairbrushes; and even certain shampoos.

Dermatologists recommend that women with thinning hair should avoid all possible causes for thinning hair, and in addition, select a liquid castile soap for shampoo, one without detergent, perfume, or dyeing agents; brush the hair only very mildy; massage gently; and avoid tight curlers. Clean hair means regular shampoos and use of a clean comb and brush. A few drops of ammonia in the wash water will facilitate cleansing the comb and brush. Weekly shampoos are recommended, but the hair can be safely washed more often, and people with oily hair, people exposed to city dirt, adolescents, and unusually active people may need to shampoo two or three times weekly.

Before wetting the hair, brush it free of tangles. Choice of shampoo is optional, but detergents dissolve grease so thoroughly that they may take more oil from the hair than is desirable. Wet the hair thoroughly; use plenty of lather; massage the scalp, using the fingertips not the nails. Rinse the hair, lather and massage a second time. Be careful to remove all the suds with the final rinse. Washing the hair in soft water gives the best results. Otherwise, the same salts that form a ring around the bathtub make the hair dull. Do not dry the hair by rubbing briskly with a towel. Instead, blot the hair carefully, because wet hair has less tensile strength and breaks easily. Use a dryer which can be carefully regulated to avoid overheating.

Daily brushing stimulates the scalp's blood vessels and helps to distribute the natural oils over the hair shafts. Women with thinning hair should brush moderately, forgetting the old rule of 100 strokes per day. Some specialists advise a gentle five- to ten-minute massage each day instead of brushing. Any brushing should be done with a moderately soft, natural-bristle brush; many nylon brushes have square-cut bristles which split and fray hairs. Women with dry hair should not shampoo too frequently, should avoid the use of bleaches, and should space permanents far apart. It may be necessary to rub a small amount of oil or lanolin into the hair after washing to restore normal sheen.

Simple dandruff represents dead skin cells from the scalp. Neglected, the flaky scales accumulate, then drop to the shoulders; however, regular nightly brushing and shampoos will usually control dandruff. Stubborn cases, showing crusting, itching, and inflammation, may be seborrhea. This involves a disturbance of the sebaceous glands and requires special measures prescribed by the family physician.

Selection and Care of Clothing

American women are continually reminded of the importance of being well dressed by spokesmen for the fashion designers, merchandising people, and advertising personnel. The money spent on clothes and wearing apparel reaches fantastic heights, yet the keynote to being well dressed lies with good grooming, careful selection of garments, and good care of them. Carefully chosen garments given proper care will last longer and look better than garments hastily purchased and poorly kept. Price is not the crucial factor. When selecting the garments consider the wear the garment will receive. Study the fabric. Is it washable? Will it require frequent dry cleaning? Are the trimmings color-fast?

The chic woman chooses garments with lines and colors that flatter her, and yet that are stylish. The popular styles of every season offer choices. It is said that American women cling to three styles; the shirtwaist dress, the Chanel-type suit, and the skirt and blouse. Colors and fabrics may vary, but these styles may be found almost every season. Simple, basic styles can be set off by accessories for high fashion. Dressing well is an art that requires study and thought beyond the scope of this book; yet a nurse needs to consider how she looks to others. When you attend a nursing meeting, you represent your profession and you are helping to form opinion of all nurses.

Because part of the clothing dollar of the nurse goes for purchasing white uniforms, she must make an extremely careful choice of street clothes. Nurses need clothes suitable for a variety of occasions, as do women of other professions. The following suggestion may help you to determine how to budget the money you spend for clothing.

Prepare a list of the clothes in your wardrobe, noting the cost of each garment, and tack the list on your closet door; then record the number of times each garment is worn. When an article is to be discarded, divide the cost by the number of times

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the garment was worn. Use this valuable information when buying new clothing.

These suggestions are among many which increase the wear of garments:

1. Read the hang-tag and follow directions for care of the garment.
2. Hang clothes carefully on good hangers.
3. Mend clothes as soon as they need it.
4. Press garments from the inside.
5. Place dress shields in wool garments.
6. Remove spots and stains immediately.
7. Watch belts and zippers; replace as needed.
8. Wear skirts the length that is flattering, with some concession to current fashion.
9. Add other suggestions.

The White Uniform

The nurse's white uniform should be worn with pride. Style variations now enable the nurse to select a uniform that is becoming to her without sacrificing comfort and ease of wearing. The professional-looking uniform is sparkling white, not dingy gray. White fabrics require special treatment in order to retain their original whiteness. Yesterday's white starched uniform was a burden to launder, but the fabric usually remained white for the length of time it was worn. The "miracle fabrics" launder easily, however, but tend to discolor, to become gray or yellow. Nylon has an affinity for any loose dye in the water, and oily soil clings tenaciously to Dacron and other polyester fibers. Combinations of Dacron-cotton handle easily, dry quickly, but may yellow or discolor.

Certain precautions serve as guides for the care of all white uniforms. Pretreat heavily soiled areas and remove stains before laundering. Some stains are set by hot water but are easily removed with cold water. Treat the garment with respect. Hang it on a hanger after wearing; do not wad the soiled uniform and toss it into the clothes basket.

Because most uniforms are sturdily constructed, machine laundering is recommended and will give the most satisfactory results, but wash only with other white garments. Do not overload the washing machine. Wash cottons in hot water and man-made fibers in warm water, always with a good suds. The slow agitation and short spin of the wash-and-wear cycle on the automatic washer will help to reduce wrinkling. Soften both the wash water and the rinse water. Thorough rinsing is essential to retain the whiteness of the fabric. Much discoloration is caused by insufficient rinsing. Do not put the white uniform through the wringer of a wringer-type washing machine. Rinse the uniform thoroughly, then hang it on a rust-proof hanger and let it drip-dry. Smooth the seams, collar, and cuffs while the garment is wet.

To hand-launder a uniform, wash it in a bathtub or washtub of water, not in a small wash basin. Use water as hot as the hands will take, and wash thoroughly, then rinse at least three times in softened rinse water. Shape it on a hanger and let it drip-dry. Nylon, Dacron, or Dacron-cotton blends will dry more quickly than all-cotton. When using an automatic dryer, set it for "low" for nylon and Dacron fabrics; on "wash-and-wear" or "medium" setting for cotton fabrics. If ironing is needed, iron with low temperature (wool setting) for nylon, Dacron, or Dacron blends. Cotton may be ironed at higher temperature.

Using chlorine bleach in the wash water may help to counteract yellowing of nylon but has little effect on Dacron. The "safe for all fabric" bleaches are of little help in the warm-water temperatures recommended for man-made fibers. Chlorine bleaches must be used with great care, because they weaken fabrics and cause holes or spots to appear. To keep your white uniform from discoloring, avoid these major causes of yellowing or graying: too short or too gentle agitation; too mild a detergent; washing with other colors or overly soiled garments; and washing at too low a temperature.

Standards may need revising in order to see that a garment may be worn out even if no holes have appeared. A white garment should be discarded when it becomes discolored.

QUESTIONS FOR DISCUSSION

1. Divide the class into small groups. Each group discusses a different product, then reports to the class the commercial brand names that members have found satisfactory as deodorants, soaps, cosmetics, facial creams, and shampoos.
2. Inspect fingernails. How do yours rate?
3. Which of the current hair styles are most appropriate for the nurse? Which hair styles are impractical or look out of place in the hospital?
4. If time permits, study how to remove stains from fabrics.

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Chapter 3

ROUTINES FOR HEALTHFUL LIVING

Good health routines allow the essential needs of the body to be met with a minimum of attention. The healthy person has energy and interest for others than himself and can spend his energy in a constructive way.

Many people with adequate energy do not realize that how one uses energy can be the difference between joyful living and mere existence. The nurse must learn not to waste energy in purposeless physical habits or damaging emotional attitudes. Later, in our study of good mental health, we will see that it is uneconomical to expend energy fretting over petty disappointments, small failures, and little injustices. Right now, let us concentrate on how to establish good physical habits, which are the basis for good health. The nurse who understands and uses good health routines can interpret them for her patient.

Sleep and Rest

The nurse needs adequate rest and sleep for her own physical health. Rested, she will be able to work with maximum accuracy, speed, and efficiency; she will be mentally efficient and emotionally stable. For these reasons a nurse should watch for signs of excessive fatigue.

Fatigue is a sensation of discomfort produced by certain toxic products upon nerve centers of the brain. Sugar and starch are stored in the muscles as glycogen. During physical exertion oxygen unites with glycogen to produce the necessary energy. Oxidation of glycogen forms lactic acid which is the result of energy expenditure. Accumulation of lactic acid in muscles causes the feeling of tiredness.

Moderate fatigue is beneficial, relaxing a person and helping him to sleep well, but excessive fatigue has many undesirable effects. The nervous system is less efficient, and many inadequate body responses result. The fatigued person is irritable, depressed, less alert mentally, and unable to get along with others. Many child behavior problems are due to excessive fatigue. Accidents are more likely to occur when a person is tired. Moreover, the fatigued person has lowered resistance to disease, and his recovery from infection is slowed. The fatigued nurse is unsafe, because her judgment is not at its best. She is accident-prone and clumsy and has increased susceptibility to disease. The fatigued nurse is a poor person to care for sick people; she may endanger the life of her patient, as well as her own.

People do not always recognize symptoms of excessive fatigue, such as dizziness, depression, dull headaches, and lack of appetite. A tired feeling is a fairly accurate sign of fatigue, but not infallible when attitude problems are involved.

Physical causes of fatigue include lack of rest, inadequate diet, poor ventilation, uncomfortable clothing, and unwise use of stimulants. Fatigue may be caused by eye strain, poor posture, painful feet, constipation, indigestion, or disease. Acute infections such as colds, tonsillitis, or influenza cause fatigue similar to that produced by physical activity. Chronic fatigue, or chronic malaise, is a symptom of diabetes and tuberculosis.

Emotions also can produce fatigue, for violent emotions affect the body functions, with a result similar to that of exercise. A strong emotional stimulus may enable an already fatigued person to exert tremendous energy, as for example, the mother of a sick child who stays with him through the crisis; then collapses when the crisis is past. Emotional expenditures such as worry, indecision, or tension can cause fatigue; monotony and boredom are also exhausting. Any form of mental vexation or irritation decreases efficiency and increases the tendency to fatigue. A feeling of disgust or resentment toward work, or irritation toward co-workers can be tiring.

Relief of excessive fatigue requires eliminating the basic trouble. Physical and mental rest are essential, but may not always be successful. If work is monotonous, changing the approach to the job for part of the day may increase physical and mental efficiency. If painful feet are causing the trouble, then corrective shoes are needed. Worry or nervous tension may be eased by an activity such as playing golf or bridge, reading a good book, or seeing a movie. One must be extremely careful regarding the use of drugs to relieve fatigue. Fatigue warnings should be heeded for fatigue is a protective mechanism, and is nature's way of warning that rest is needed. To disregard this warning is unwise and may even lead to catastrophe. Nurses must be particularly sensitive to the feelings of fatigue and discern whether it is the normal tired feeling resulting from a day's work or excessive fatigue from physical causes or emotional expenditures. If chronic fatigue persists after visible causes are eliminated, consulting a doctor for examination and diagnosis should be the next step.

Sleep, the great restorer, provides rest for the nervous system, yet it is easier to describe what happens when a person sleeps than to say how, or why, he sleeps. During sleep the muscles relax almost completely. Breathing is slower and deeper; the heart beats more slowly; blood pressure and body temperature go down. The body processes (digestion, circulation, assimilation, and respiration) continue but at a slower rate. The brain is not idle, but the pattern of brain waves may change. That is, fewer messages are sent to and from the brain. As the sleeping period ends, temperature, respiration, pulse, and blood pressure gradually return to the daytime levels. The quality of sleep varies and is deepest during the second and third hour. Sometimes a person arises in the morning still feeling tired. Benefits from sleep may be less if the person is excited or worried, dreams a lot, suffers pain, or hears noises. Comfortable and restful surroundings help one to obtain the maximum benefits from a good night's sleep therefore give attention to such matters as the kind of mattress, fresh air, and room temperature.

Insomnia can be a vexing problem and frequently a person becomes so obsessed with the fear of not sleeping that sleep is even more remote. Sleeplessness may stem from an emotional problem such as extreme nervousness, worry, or tension, or from a physical cause, such as excessive fatigue, pain, overeating, or constipation. To prevent or cure insomnia the person needs to eliminate disturbing factors and then find a method of relaxation before retiring. The day's activities should slow down. Women do this with the bedtime routine of cleansing the face, pinning up the hair, and getting clothes ready for wear the next day. A warm, not hot, bath is soothing and relaxing. One should keep fairly regular hours, not early to bed one night and late the next. Some people need physical exercise during the day to produce moderate fatigue. In cold weather, extra warmth at the feet may help; deep breathing and a concentrated effort to relax certain muscles may also lead to sleep. Increased physical activity produces moderate fatigue. A person goes to sleep more readily if he is moderately tired. Too few interests in life may indicate that a person thinks of himself constantly and worries about sleeping poorly; hence he does sleep poorly. More interests may take his mind off himself. Forcing oneself to think of a monotonous routine or "counting sheep" keeps one's thoughts away from troubles. If the sleepless person could assure himself that rest helps to restore the body, he might worry less.

Not everyone needs the same amount of sleep; the amount of sleep required varies with the age of the person, his activity, health, and nervous and emotional control. However, eight hours is a good minimum average for most people. General recommendations are eleven to twelve hours of sleep for ages six to eight; ten to eleven hours for ages nine to thirteen; nine to ten hours for ages fourteen to sixteen; eight to nine hours sleep for ages sixteen to twenty-one; and seven to eight hours sleep for adults.[1] Many adults in their late forties and fifties find that they sleep less than when younger. Excessive sleep may indicate that the person is withdrawing from the realities of life. He does not know what to do, so he sleeps. Scientific research does not explain why, but indications are that people actively interested and enthusiastically anticipating the next day may get along with slightly less sleep than the bored person.

Rest may be obtained in other ways than sleep; it may be obtained by changing activities, participating in a hobby, or simply lying down in a quiet place and relaxing. Relaxation periods during the day are especially valuable to adults who find responsibilities increasing and their strength decreasing. One half hour of genuine rest (ideally, lying down in a quiet place) will help to compensate for not getting the required amount of sleep at night. Truly busy people learn to take advantage and completely relax during otherwise wasted moments, such as when sitting under the hair dryer at the beauty shop or riding the commuter train or bus. Adequate rest is difficult, but not impossible to achieve in this day of hurry and stress.

Exercise and Recreation

Recreational activities which involve exercise promote physical fitness and contribute to enjoyment of life. Physical fitness means more than strong muscles and endurance; it is good health plus the capacity to perform everyday tasks and to meet emergencies as they arise. Benefits from exercise and fitness are numerous despite the few occasions today which require sheer physical strength. The physically fit nurse can perform her daily tasks with relative ease for she moves efficiently and hence has poise and grace. Exercise helps achieve good muscle tone, posture, and weight control. Inactivity is often as critical as overeating in weight gain. A moderate amount of vigorous exercise, carried out regularly is good preventive medicine for a heart attack, says Dr. Paul Dudley White, heart specialist. He says that active people have fewer heart attacks and a better recovery from attacks than the inactive. Enjoyable physical exercise can also provide relief from tension and mental fatigue as it serves to control emotions—a safe and natural tranquilizer.

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[1] *7 Paths to Fitness* (Chicago: American Medical Association, 1964).

The physically fit person has strength and endurance to help protect against accidents; for reacting quickly and with physical decisiveness may enable one to avert a serious accident. Regular exercise may both prolong life and help one to enjoy it, giving an overall feeling of zest and well-being. The most obvious effect of regular exercise is to increase muscular strength. With exercise, soft, flabby muscles become hard and firm, and like other muscles, the heart also becomes stronger and functions better. Exercise affects the general metabolic processes of the body for as the rate and force of the heartbeat increase, breathing is more deep and rapid, and heat production and perspiration increase. The energy to support exercise comes from the oxidation of food substances, largely carbohydrates and fats, which results in improved appetite and increased elimination.

Judicious exercise, at the right time, facilitates child growth. Studies show that systematic muscular exercise leads to the increase of height, weight, and vital capacity of growing youth. In young adulthood, systematic exercise increases body weight, shoulder breadth, and strength beyond changes resulting from maturation. The amount of exercise that is beneficial depends upon age, sex, physical condition, and regularity of exercise. Children and young adults will fatigue to the point of exhaustion and recover promptly after a period of rest. The person of middle age and older must be cautious for he cannot recover quickly from complete exhaustion. Moderation is the key factor. If a person stops when he is pleasantly tired, he will keep exercise below the point of physical exhaustion, yet exercise should be vigorous enough to tax the power of the person's muscles.

The ability to recuperate after physical activity is a good guide to appropriate strenuousness at any age. Recuperation should be reasonably prompt. The exercise has been too severe or too prolonged if breathlessness and pounding of the heart are still noticeable ten minutes after exercise, or if marked fatigue lingers the following day. The person who has been inactive should begin exercise slowly and increase the pace and vigor as strength and endurance improve. The kind of exercise suitable will depend on individual preferences and accessibility, in addition to sex, age, and health. Exercise should be enjoyed; it should fit into one's daily schedule, and be vigorous enough to give a tonic effect. Women and girls should select an activity that involves a minimum of body contact and no heavy lifting. Activities that best fulfill these requirements for most people include bowling, hiking, skiing, golfing, tennis, volleyball, handball, riding, swimming, boating, fishing, and gardening. Many people are not able to indulge regularly in these activities and get their exercise by walking or from calisthenics. The floor duty nurse usually gets enough walking, but might profit from daily calisthenics.

Recreation comes from a word meaning to re-create. A nurse should return to her work refreshed. If her off-duty hours include some fun and relaxation, she is less likely to worry about her patients. Healthy play and recreation help an individual to find relief from his troubles, thus helping to improve both physical and mental health. How one uses leisure time can be a crucial health factor.

As a busy student nurse you can probably scarcely visualize having generous amounts of leisure time; but after your nursing course is completed, you will have more free time, and even though you continue your efforts to follow the new developments in nursing, you will probably have some leisure time at your disposal. With the prospects of a shorter working week facing Americans, wise use of leisure time will become a problem of national importance. Possibly a few fortunate people are engaged in professions that offer adequate variation in activities. If such people learn how to find relief from tension, hobbies are not crucial. A college professor who combines advanced study with administrative duties and teaching leads an interesting life, one of continued intellectual growth and contacts with stimulating people. Diverting energy into a time-consuming hobby might lessen his effectiveness. But the majority of people are employed in routine work, and for them, a distinct change is beneficial. You, the student nurse, may find that truly enjoyable recreation during off-duty hours will help you to form the habit of "leaving the patient's problems at the hospital."

The most beneficial recreation fits the individual taste, but if possible, it should include exercise. There is an old adage, "Exercise must be fun, or it won't be done." The list of recreational activities is endless. Hobbies range from collecting stamps to photography; outdoor activities, such as camping or gardening, have many health-giving benefits; and the fine arts encompass a wide range of creative activities, such as painting and sculpture. As machine-made items become plentiful, craftwork is popular again. We treasure the handmade articles. Note the revived interest in crewel embroidery, cross-stitching, knitting, and quilting. Many people are also sportsminded, as evidenced by the increasing popularity of golf, bowling, and boating.

Food Habits

The food that one eats provides the basis for good health and no discussion of routines for healthful living would be complete without mentioning food. While a student nurse, you will make a thorough study of the normal diet in the nutrition class. But you need to do more than study the well-balanced diet; you need to make an effort to eat the foods recommended. Remember, it is not having a knowledge of good nutrition that leads to good health, it is actually consuming the right foods each day that will benefit you.

From the basic four food groups recommended, do you eat the foods you need?

Group 1. Meats—two or more servings daily.
Group 2. Milk—two cups for adults; four cups for children and adolescents.
Group 3. Bread and cereals—four or more servings.

Group 4. Fruits and vegetables, four or more servings.
Extras. Based on caloric needs.

Breakfast should furnish one third to one fourth of the day's food needs; the nurse needs an adequate breakfast. Her morning assignment includes difficult and strenuous tasks and she cannot do her work well without the energy that food provides. Occasionally a beginning student nurse will become ill. Often the first question asked by her nurse supervisor is, "Did you eat breakfast?" If you are one of those people who do not eat breakfast, you can train yourself to do so by getting up a little earlier in the morning and giving yourself plenty of time. Begin by eating a small amount, then increase the amount of food eaten. Get plenty of rest. If you overeat on sweets before retiring at night, you will have a full feeling in the morning and no appetite. Possibly getting one's uniform ready to wear in the evening may lessen the tension in the morning and allow one to be relaxed enough to eat breakfast.

Regularity of meals is important; eat at approximately the same time each day. Good atmosphere at mealtime will enable the body to best utilize the food. Mealtime should not be hurried. Emotional upsets interfere with digestion and with the impulses supplying digestive juices. Be willing to vary your meals and eat many foods.

Overweight Americans number one out of every five people. Table 3–1 gives desirable weights for men and women. Extra pounds make extra work for the body and tend to shorten life. Diseases of the heart and blood vessels, diabetes, and arthritis strike the obese more often and more seriously than they strike those of desirable weight. In order to lose weight, the overweight person must genuinely want to lose weight. He must discipline himself to decrease the intake of food. Exercise is good, providing he can resist his increased appetite. Food intake may be controlled by making the food less appetizing, by vigorous exercise immediately before the meal, by taking away the delicious aroma of food, or by acquiring new interests in life. It may be easier to eat less when other activities are more interesting. Table 3–2 gives the calories needed for various activities.

Table 3–1. *Desirable Weights for Men and Women (According to Height and Frame, Ages 25 and Over)*[*]

	WEIGHT IN POUNDS (IN INDOOR CLOTHING)		
HEIGHT (IN SHOES)	SMALL FRAME	MEDIUM FRAME	LARGE FRAME
MEN			
5′ 2″	112–120	118–129	126–141
3″	115–123	121–133	129–144
4″	118–126	124–136	132–148
5″	121–129	127–139	135–152
6″	124–133	130–143	138–156
7″	128–137	134–147	142–161
8″	132–141	138–152	147–166
9″	136–145	142–156	151–170
10″	140–150	146–160	155–174
11″	144–154	150–165	159–179
6′ 0″	148–158	154–170	164–184
1″	152–162	158–175	168–189
2″	156–167	162–180	173–194
3″	160–171	167–185	178–199
4″	164–175	172–190	182–204
WOMEN			
4′ 10″	92–98	96–107	104–119
11″	94–101	98–110	106–122
5′ 0″	96–104	101–113	109–125
1″	99–107	104–116	112–128
2″	102–110	107–119	115–131
3″	105–113	110–122	118–134
4″	108–116	113–126	121–138
5″	111–119	116–130	125–142
6″	114–123	120–135	129–146
7″	118–127	124–139	133–150
8″	122–131	128–143	137–154
9″	126–135	132–147	141–158
10″	130–140	136–151	145–163
11″	134–144	140–155	149–168
6′ 0″	138–148	144–159	153–173

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[*] From *Statistical Bulletin* (November-December 1959), Metropolitan Life Insurance Company, New York. By permission of the Metropolitan Life Insurance Company.

Table 3–2. *Kind of Activity Determines Calories Needed* [*]

KIND OF ACTIVITY	DESCRIPTION	CALORIES PER HOUR (INCLUDING BASIC METABOLISM NEEDS)	
		WOMEN	MEN
Sedentary	Reading, writing, watching television, sewing, playing cards—i.e., all activities requiring no standing and little arm movement	80	100
Light	Preparing meals, washing dishes, dusting, handwashing small articles, walking slowly	110	160
Moderate	Making beds, ironing, mopping and scrubbing, sweeping, walking 3 m.p.h., standing and using some arm movement, sitting and using much arm movement (typing rapidly)	170	240
Vigorous	Heavy scrubbing and waxing, bowling, golf, walking 4 m.p.h., weeding the garden	250	350
Strenuous	Playing tennis, water skiing, swimming, bicycling, dancing, running, digging in the garden, playing football	350	more

[*] Adapted from Louise Page and Lillian Fincher, *Food and Your Weight*, Home and Garden Bulletin No. 74, U.S. Department of Agriculture, p. 4, revised October 1964.

Underweight people seldom receive sympathy, yet it may be very difficult to gain needed weight, for to gain weight requires adjustment in ways of living. It is necessary to correct other habits that impair eating. The person needs more rest and relaxation, fewer outside interests, less activity, and more interest in food. Where the overweight person watches to eliminate high-calory foods, especially high-calory snacks, the underweight person should try to incorporate them in his daily food intake. Examples of how this might be done are the following: cream on cereal instead of whole milk, a drink of milk instead of water, a four o'clock milkshake instead of a cola drink. If the underweight person can be convinced that he will have more energy with a little more weight, he may make the effort to gain.

So-called diet aids are among the most lucrative of medical frauds today, and the nurse should be alert to their dangers. People will seek the easy solution for problems. When a pill or tonic offers an easy way to lose weight, people are tempted, but there is no really easy way to lose weight. It requires discipline. Drugs taken without prescription can be extremely dangerous. The miracle diets, diet pills, tonics, "medicated" caramels, chewing gum, cigarettes, and other items are nonsense. Federal investigators estimate that overweight Americans waste $100 million annually on worthless reducing products.

Regular Elimination

The regular elimination of body wastes helps one feel well. If life is organized and routines are established, these things take care of themselves, and time and energy are not expended with fretting and with the discomforts of constipation. Habits vary, and regular elimination means daily bowel movement for some people, less frequently for others. For those whose intestines move more slowly, every two or three days may be regular; for some healthy people, every five to eight days is normal. Bowel movement rhythm is an individual characteristic; it is the regularity that counts.

Laxatives and cathartics have been developed into a million-dollar business. Their wide use emanates partly from the false belief that a daily elimination is essential for health and beauty. Regular elimination does not improve the complexion, as some people believe. Lack of regularity can make a person uncomfortable. Laxatives are mildly purgative medicines that produce one or two evacuations without pain, whereas cathartics are active purgatives and produce several evacuations, which may or may not be accompanied by pain. Appropriately used, laxatives and cathartics give temporary relief by stimulating contractions of the intestines, but their continual use is unwise because they prevent the natural roughage of food from stimulating the intestinal walls. The cathartic habit can actually cause constipation and disease of the rectum. Attention to good hygiene habits is the safest approach to the problem of constipation. The nurse must be certain to avoid the use of laxatives when acute pain, cramps, or soreness are present in the abdomen. These may be a warning of appendicitis, kidney stones, gall-bladder colic, or heart attack.

Encourage regular elimination by eating the proper food at reasonably punctual meals. Include fresh fruits and vegetables in the diet to supply the needed roughage. (It is possible, however, to get too much roughage.) Drink plenty of water and fruit juice, especially citrus juices. It is important to heed the nerve impulses in the rectum that indicate waste is ready to be emptied. Many times this is overlooked. Good posture helps to keep abdominal organs in position; appropriate exercise or physical activity helps to maintain good muscle tone. People with sedentary habits should plan for physical activity. Rest and relaxation are important, as tension contributes to constipation. Establishing a routine time for evacuation, such as immediately after breakfast, can help to reduce tension and worry.

Constipation means "crowding together." If the solid waste material, the feces, remain in the rectum, water is lost and the feces become dry, hard, and difficult to expel. The pressure of the feces in the rectum causes discomfort, but constipation does not cause "poisons" to be absorbed in the bloodstream, as some people erroneously believe. In addition to local discomfort and a feeling of fullness, the constipated person may have a headache and be irritable or listless.

There are two kinds of constipation, and prevention and correction are quite different for both of them. Atonic constipation is more common among malnourished people, or those leading sedentary lives. The bowel musculature lacks tone, and the colon becomes enlarged. Prevention and correction depend largely upon the preceding hygienic measures which help to establish regularity. A high fiber diet will furnish bulky waste that helps to stimulate intestinal walls. This includes vegetables high in cellulose; fruits; whole-grain cereals; and plenty of water, milk, cream, and butter. Fats help to oil and soften the contents of the intestines.

Spastic constipation occurs more often in tense, nervous, and high-strung people. Persistent, spasmodic contractions of the colon are accompanied by pain. Above the regions of contractions, the colon relaxes and distends. The abdominal area over the colon is tender to the touch. The person may be nervous, irritable, and have nausea, vomiting, and fatigue. Spastic constipation is caused by overstimulation or irritation of the colon. It may result from too much worry or anxiety. Or the colon may be irritated by excess alcohol, condiments, coarse vegetables, whole bran, or laxatives. Bland, nonirritating foods are needed to soothe the intestines until the spasms are relieved. The diet should be balanced, without gas-forming foods. Relaxation and extra sleep may help. Medical attention is usually necessary to correct the more serious cases.

Signals indicating trouble must not be overlooked. The trouble may be greater than constipation if evacuation feels incomplete; if bowel movements are difficult or painful; if constipation develops suddenly with the person who has had good bowel movements; if there is intermittent diarrhea and constipation; or if bleeding accompanies elimination. Any major change in bowel habits should be noted and reported to one's physician.

The Common Cold

The cold, most common of all human illnesses, continues to extort heavy prices in personal suffering, absenteeism from school, and financial loss to industry. Almost every adult has a cold during the year, and many have two or three. Young children have more frequent and more severe infections than do adults.

The cold is an inflammation of the upper respiratory tract characterized by irritated nasal passages and sinuses, watering eyes, chilliness, and feelings of weakness. It is caused by viruses. Not one or two, but at least twenty viruses have been identified as important causes, and each virus is sufficiently different to require a specific immunity. Hence, a vaccine may be successful against one virus without protecting against others. Similarly, antibodies produced while recovering from one cold may protect the person against that virus, but not against other viruses. Some susceptible people appear to have a cold all winter.

To date, there is no cure and no completely successful vaccine for the common cold, although it is known how to escape some colds, how to lessen their seriousness and avoid complications, and how to guard against their transmission. The nurse should understand these facts, and be wary about reporting for nursing duties with a cold. Her patients need special protection, for their resistance is already lowered. With a cold her own resistance is weakened against other infections. The nurse should never shrug off the common cold as insignificant.

The period of communicability for a cold is from twenty-four hours before the onset of symptoms to five days after the clinical signs are recognizable. This means that the cold is in a highly contagious stage when no illness seems to be present. To say, "Avoid people with colds" may be good advice, but not always possible. Transmission of the cold virus is by direct contact, or indirectly by droplets spread and articles soiled by the discharge of the infected person. It is seldom practical to isolate the person with a cold, but contagion may be minimized by observing the following personal hygiene measures: cover the mouth and nose when coughing and sneezing; dispose of nose and mouth secretions through the use of disposable tissues; thoroughly wash and scald eating utensils used by the infected person; use individual washcloth and towel; and wash the hands often, especially before eating and after touching a person with a cold. If you have a cold wash your hands thoroughly after blowing the nose.

Complications which may follow a cold are pneumonia, bronchitis, sinusitis, ear infection, and streptococcus nose and throat infections. Uncomplicated, the cold may run its course in two to seven days, but when the body's resistance is mobilized to fight the cold virus, organisms causing secondary infections can take hold more easily. Some of the organisms causing these infections are always in the throat and nose, and their numbers increase during the third or fourth day of a cold. Hence, extreme fatigue, changes in temperature, or emotional upsets at that time increase the likelihood of pneumonia, bronchitis, or laryngitis. The infection is less likely to spread to the middle ear if the person blows his nose gently, with the mouth open and the nostrils unobstructed by pressure.

Note early cold symptoms. The first sign of a cold is dryness and burning of the throat. Then follow sneezing, tight chest, aching muscles, coughing, sore throat, watery eyes, and swollen glands of the neck. The person may be chilled, feel weak, and have fever. Prompt action at the first signs of a cold will tend to lessen its seriousness, ward off the dangerous secondary infections, and reduce exposure to others. Rest and warmth are essential, but if staying in bed is not possible, at least get extra rest. Protect yourself against drafts, chilling, and fatigue. Drink plenty of liquids, especially the citrus juices. Proper elimination is important. Do not overeat, and avoid foods that are hard to digest. Some people get effective results at the beginning of a cold by gargling strong salt water or taking aspirins. Most medications do not cure the cold, but some ease the discomforts. Steam from a kettle or vaporizer will relieve nasal congestion. If fever develops, bed rest should be considered imperative. Today, physicians discourage the indiscriminate use of antibiotics for uncomplicated colds and viral, upper-respiratory infections. These valuable aids should be reserved for more serious conditions and complications of the cold.

Prevent colds by practicing good general health measures. Eat well-balanced meals which provide an adequate supply of vitamins. Avoid chilling and sudden changes in temperature; some people are especially sensitive to chilling from wet feet. Get plenty of sleep. Keep room temperatures moderately warm, and air humidity fairly high. Hot, dry air will stiffen nose membranes which, if moist and limber, may repel virus invaders. Cold susceptibility is increased by worry, anxiety, lack of sleep, and excessive fatigue. Dress appropriately for the weather. During cold epidemics try to avoid crowded amusement places or large gatherings of people.

QUESTIONS FOR DISCUSSION

1. What hobbies are popular among class members? What activities are particularly helpful for the nurse?
2. Observe your routines carefully for one week. Do you get sufficient sleep, rest, exercise, and proper food?
3. Note when you developed a cold during the past year. Could it have been avoided?
4. List cathartics and laxatives. When are these given during patient care?

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Chapter 4

POSTURE AND FOOT CARE

Correct posture and good body mechanics help the nurse to conserve her energy, which in turn enables her to provide better care for the patient. Good posture allows the body to function with a minimum of strain, and an erect, graceful carriage inspires confidence in others. The smooth, effortless movements of an efficient nurse tend to generate ease in the patient. If she is overweight or underweight, it is less noticeable with good posture. When properly balanced, the body is poised and presents a beautiful appearance.

Nurses walk on hard floors for many hours each day. If the nurse gives special attention to her feet, she may be able to prevent painful foot problems from arising.

DEFINITIONS

Posture is the way that the parts of the body are aligned at rest or in action. Correct posture assumes that the various segments and systems of the body are so adjusted as to permit normal function without undue strain on any part. Posture includes all positions of the body, standing, sitting, or lying down.

Body mechanics deals with coordination of the movements of the body. Good body mechanics implies the proper application of good balance and skillful muscular coordination in all movements and positions. The person moves gracefully, easily, and efficiently. A nurse needs to practice good body mechanics because she is continually lifting patients, manipulating equipment, and handling supplies. One wrong movement can result in a painful, strained back that is not quickly alleviated. Good body mechanics are emphasized in all nursing procedures.

Posture and Health

Posture is a by-product of an individual's general health. The healthy person has good muscle tone, that is, muscles of sufficient strength to hold the body erect and to resist the forces of gravity. Muscle tone is influenced by nutrition, exercise, and rest. Frequently the muscles of a sick person become too weak to give adequate support to the different parts of the body. The muscle tone is poor, the body yields to the power of gravity, and posture droops or sags. Nurses continually check to see that the patient has good body alignment. Unhappiness and tension may also increase the tendency to poor posture, and faulty carriage may give graphic evidence of past or present mental depression. If the mind is depressed the physical body reflects the mental attitude. Often by assuming good carriage, the person feels better. This is partly psychological and partly because of improved organic functioning. Faulty posture does impair body functioning by producing minor symptoms such as headache, backache, indigestion, constipation, and menstrual pain. Good posture indicates easiness and lack of tension. Hence, tension and strain make for rigidity, a hindrance to good posture.

Posture has been described as an expression of attitudes which reflect the person's general health, state of mind, and outlook on life.

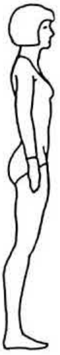
Correcting Poor Posture

Improving health and relieving fatigue are the first steps necessary to improve posture. One should also correct hampering and fatiguing physical conditions, such as soft, sagging beds, inappropriate chairs or desks, tight clothing, and high-heeled or rundown shoes.

Poor posture will probably continue unless relief is found from emotional problems; however, posture may be improved by a direct approach. The basic factor in posture is muscle tone, and muscle tone is dependent upon exercise, nutrition, and rest. The right kinds of food provide the necessary nutrients for growth, replacement, and repair of muscle cells. Exercise builds muscular strength and improves circulation. Rest and relaxation overcome fatigue and provide an opportunity for the muscles to recuperate. It is difficult to maintain good posture when fatigued. In order to improve posture, a person must first have the proper feel of good posture when sitting, standing, or walking (see Figure 4–1). One does not immediately corect habitually poor posture, for the person may experience discomfort at first because muscles are being stretched that were previously held in a shortened position. Frequent self-evaluation and correction of errors will help to make good posture a habit. Corrective exercises will help to develop muscle tone and to stretch muscles.

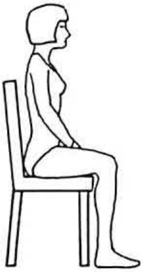
To Prevent Backache

An aching back is such a common complaint that preventive measures should be known and applied; however, correcting poor sitting or standing posture has been shown to relieve back pain. When lifting, bend at the knees and let the legs, arms, and hips help the back. Do not bend over and twist at the same time. The nurse should avoid overexertion. Know your physical limitations and observe them. Change positions frequently. People who sit for long periods, either working or traveling, should get up, move



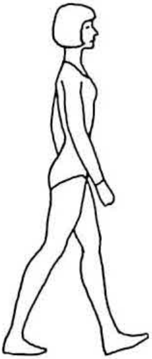
Standing

1. Feet parallel, about six inches apart. Toes straight ahead. Weight supported on balls of feet.
2. Head high, chin up, back straight, eyes straight ahead; as if balancing a basket of fruit.
3. Chest slightly up and forward.
4. Draw in abdomen, pull it backward and upward.
5. Hips tilted down in back.
6. Lower back flattened.
7. Keep shoulder high and square; shoulder blades flat.
8. Knees straight, relaxed.



Sitting

1. Hips pushed back, touching back of chair.
2. Feet flat on floor.
3. Abdominal wall flat, chest out, body straight from hips to neck.
4. Rock forward from hips when writing.



Walking

1. Keep body erect as in standing.
2. Feet parallel and close together as you step.
3. Toe straight ahead.
4. Place the heel first in stepping; roll from heel to toes on outer borders of the feet; push off with the toes.
5. Push forward with the back foot.
6. Control length of step for even rhythmic stride.
7. Swing arms freely.

Figure 4–1. Good posture standing, sitting, and walking.

about, and stretch occasionally, as this helps to avoid cramped muscles. Remember, backache may be aggravated by emotional tension or anxiety.

FOOT CARE IMPORTANT TO NURSE

Painful feet rank close to the common cold as one of America's major health problems. The American Podiatry Association estimates that 70 per cent of the people suffer from some form of foot malfunction. This is in contrast to the fact that 99 per cent of all feet are perfect at birth.

Because the foot constitutes a highly specialized appendage of twenty-six bones and thirty-three joints, it demands special care. The feet function daily under considerable pressure and strain, with much of the walking on hard city pavements or nonresilient hospital floors. The added strain can cause painful feet and lead to symptoms of backache, headache, nervousness, and fatigue. The familiar saying goes, "When your feet hurt, you hurt all over." The wise nurse knows that her feet need proper attention and that the properly fitted shoe is the key to comfort.

Choice of Shoes

Fashion dictates the styles for women's shoes. If thin-soled, tiny-heeled shoes are worn for short periods of time when no walking is involved, little permanent damage results. Serious injury, however, can result from wearing these inappropriate shoes for work. In one respect, nurses have an easier solution to the problem than other women. Saleswomen, schoolteachers, and beauticians, who stand many hours daily, must select appropriate shoes from among the dress shoes available. The nurse's white shoes are designed for comfort and function. Yet every person's feet are different, and you need to select your white shoes with great care to ensure the proper fit. Examine the sole of your foot and note the three areas: the ball and toes, arch, and heel. In the average foot all three are similar in length. In the long, narrow foot, the arch and toe area is longer than the heel area. Hence a shoe last is needed which conforms to this type of foot configuration. In a high-arched foot, the upward curve of the foot is pronounced, and a shoe with a high-raising throat-line would be uncomfortable and would cut into the top of the high arch. The low-arched foot has little or no curve and requires a shoe last which gives support to prevent cramping the toes as the foot slides forward.

The sole should be at least one-fourth inch thick to protect the foot against hard surfaces. The heel of the shoe should be broad enough for a firm base and should be resilient. Shoes of natural leather have long been preferred because leather does not shrink; it expands with changes in weather, and it allows some evaporation of moisture.

Select shoes that are long enough for the toes to move naturally, usually ¼ to ½ inch longer than the big toe. (Stockings should also be ½ inch longer than the longest toe.) Have your feet measured each time that you buy shoes; foot sizes can change. A different style of shoe may also mean a different size of shoe. Aside from the actual construction of the shoe, other points should be considered. Do not buy shoes that look good but feel slightly uncomfortable. A shoe which needs "breaking in" is the wrong shoe. Take your time when selecting shoes. Try on as many different lasts as necessary to find a comfortable, properly fitting shoe. Buy shoes at the end of a shopping trip rather than at the beginning. Your feet will be larger then and more tired, therefore shoes which feel comfortable under those conditions are likely to fit properly. If you buy shoes in cold weather, allow for foot contraction; in hot weather allow for normal swelling.

Foot Hygiene

Foot comport depends on properly fitted shoes and stockings and on good hygiene practices. Bathe the feet at least once daily and dry them thoroughly. If feet perspire freely, dust them with foot powder. Rub dry or chapped feet with baby oil. Wear fresh stockings each day and, if possible, do not wear the same shoes on consecutive days. When the feet get wet from rain or perspiration, change shoes as well as stockings. Watch for tears in the lining of shoes; they can cause blisters.

Trim toe nails straight across; and smooth rough edges with an emery board. The corns and calluses which plague many adults are caused by undue pressure brought on by bad posture, foot imbalance, enlarged and irritated joints, or ill-fitting shoes. The pressure causes the body to build up the skin faster than it is sloughed off, and the outer layer of skin hardens; the hardened and thickened skin is a callus or corn. The calluses are shallower and cover a wider area than corns. Both cause pain by increasing the pressure on the lower layers of the skin. For temporary relief soak the feet in warm water each day, rub in lanolin to soften the hardened spots, and apply pads of lamb's wool to ease the pressure. Do not trim a corn or callus, because this may cause infection. Seek professional advice from a qualified podiatrist or a physician for foot disorders. Minor aches and pain can lead to more serious problems if ignored.

To Strengthen Feet and Relieve Fatigue

Walking outdoors is the best general exercise for the feet, as it helps weakened muscles to regain strength and elasticity. But because nurses walk many hours each day, other exercise may be more appropriate. To strengthen toes and feet, try to grasp a large marble (or a pencil, golf ball, or sock) with your toes. Use the toes of the right foot for a while, then the toes of the left foot. Stand on a thick book with your toes extending over the edge. Now bend the toes downward and try to touch the edge of the book; repeat this a dozen times or more. To help develop balance as well as strengthen the toes, walk on tiptoe as long as possible before falling back on the feet. Do this exercise with the feet toeing in. To help weak feet, walk with your weight on the outer edge of the foot, the toes curled inward and the arches high. Keep the feet pointing straight ahead.

If the feet seem cold, exercises can improve circulation. Sit in a chair with shoes off, straighten your legs out in front of you, move your feet up and down as far as they will go. Rotate each foot, first in one direction and then in the other, or swing each leg back and forth from the knees for a short time. Repeat these exercises several times a day to stimulate normal circulation. Also avoid wearing circular garters or sitting for long periods with the legs crossed.

Many student nurses complain of tired feet following their first days of eight-hour floor duty. You can help to relieve fatigue by elevating the feet above the hip level. It also helps to remove your shoes, rotate the feet, and wriggle the toes. Alternating hot and cold foot baths, ending with the cold bath, will stimulate circulation and reduce swelling.

If you observe these commonsense measures, your feet will serve you well and will carry you through life with a minimum of discomfort.

QUESTIONS FOR DISCUSSION

1. With the use of a plumb line, in front of a full-length mirror, check the posture of each student nurse.
2. Demonstrate exercises which help to correct poor posture.
3. Test the fit of your nursing shoes with this simple procedure: remove the shoe, trace the outline of the foot on paper, then place the shoe on the tracing. Does the shoe fit well?
4. Describe and compare different makes of nurses' shoes. Which ones have proved satisfactory?
5. Good care of nurses' shoes will extend wearing time. Describe the care that should be given to shoes.
6. Arrange for showing such a movie as: "Improve Your Posture,"

ten-minute film, Coronet Instructional Films, Coronet Building, Chicago, Ill.

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Chapter 5

FEMININE HYGIENE

A nurse must understand the anatomy and physiology of menstruation and menopause for her own health and personal daintiness, and to be able to instruct and to help others. Menstruation is a natural body function, not an illness or abnormal condition. But today's way of life is not entirely natural, and many signs indicate that the stresses of modern living aggravate this normal body process. Painful menstruation (dysmenorrhea) may be on the increase. One industrial survey reported that 16.5 per cent of the women required time off from work because of dysmenorrhea,[1] and physicians have reported that about 35 per cent of all women are affected with this disorder. It has been stated that economic loss to the individual and to industry is three times as great as from the common cold.

Physicians say that unless a physical disability exists, the majority of menstrual problems could be alleviated by proper care of the body and attention to health. Certainly an effective nurse should not let menstrual discomfort cause her to spend one week out of four in bed; she should not even miss work one or two days each month. If you are one out of three women who suffers genuine pain with menstruation, study carefully the recommendations and analyze your own health habits.

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[1] Catherine Roth, *What Women Want to Know* (Glenbrook Laboratories, Division of Sterling Drugs, Inc., 1961).

Purpose

The average female regards menstruation as a troublesome time of the month, forgetting the biological purpose. The menstrual cycle serves to prepare the uterus for pregnancy. It is nature's way of ensuring reproduction of the human race. Menstruation is the flow of blood from the uterus through the vagina. It occurs for a few days about once a month. The name is derived from the Latin word *menses,* which means *month.*

PUBERTY AND MENARCHE

The first menstruation, called menarche, is too often a traumatic event to the young girl, and she needs tactful help from adults. Ideally, her mother explains the cycle to her; often, however, communication is not good between mother and daughter. The young person looks with respect to the nurse and may listen to her carefully. The registered, professional nurse may be asked to teach a class of thirty students. The practical nurse is not expected to be a classroom teacher, but she should be able to explain in a nice way the developmental cycle to a girl of nine, ten, or eleven.

Adolescence is the period between childhood and adulthood, the in-between years when the person grows into maturity. It stretches over a period of several years, usually during a person's teens. Puberty is the time of sexual maturity, and in girls, this is marked by menarche. In boys there is no sudden indication. Before menarche the young girl's body has been undergoing changes caused by hormonal interplay between the ovaries and the pituitary gland. A small amount of hormone from the pituitary gland stimulates the ovaries to further develop the incomplete eggs, and to produce some of the hormone estrogen. The amount of estrogen formed is inadequate to cause menstruation, but adequate to cause changes in the body. Estrogen halts the growth of the long bones of the body at appropriate times. Formerly it was believed that growth stopped with menarche. Now it is known that the major spurt of growth occurs before menarche, but growth of the long bones continues slowly for one to three years after menarche. Estrogen also causes the secondary sex characteristics to appear, such as enlargement of the breasts, appearance of pubic and underarm hair, and widening of hips. Estrogen causes the uterus to enlarge, the lining of the vagina to thicken, and helps to maintain the proper acidity of the vagina.

Average Age of Menarche

The age of maturation varies with general health, nutrition, race, sanitation, climate, and social status. The effect of climate and social status upon age of menarche is probably that of nutrition, sanitation, and general health. In the United States the average age of menarche has been thirteen years, with the range from eleven to sixteen and a half years. Today's earlier menstruation is probably caused by improved nutrition and health. It has been estimated [2] that in areas of the world where sanitation and health approach perfection, the average age of menarche stabilizes at eleven and a half to twelve years. Certainly menarche before nine and after seventeen is abnormal in this country.

Explain Correctly

Because menstruation begins at an early age, it is important to instruct the young girl in language that she can understand. You might say to a very young girl, "Your body is growing up inside as well as outside." It has been explained, "The uterus is shedding tears because no baby is forming." Emphasize that menstruation is a normal, healthy function, a part of growing up. Being adult means accepting responsibilities as well as privileges.

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[2] Charles R. Gilbert, *Better Health for Women* (Garden City, N.Y: Doubleday, 1964).

As a student nurse, you will learn the exact terminology when studying anatomy. The following description is more detailed than you would use when explaining the process of menstruation to a young girl, yet correct terms should be used.

MENSTRUAL PHYSIOLOGY

To understand the process of menstruation, a knowledge of the female organs of reproduction is necessary (see Figure 5–1).

The uterus is a hollow, pear-shaped, pelvic organ, about 3 inches long. This thick-walled, muscular organ is sometimes called the womb. The external opening to the uterus is through the mouth of the cervix. The uterus makes possible the prenatal growth of the baby by providing a place for the fertilized egg to implant and develop.

The vagina is a short, muscular, narrow channel leading from the uterus to the outside of the body.

The ovaries are two solid bodies, about the size of walnuts, which are located on either side of the uterus and close to the terminal openings of the Fallopian tubes. Each ovary contains thousands of tiny, microscopic cells called egg cells, or ova. (One cell is an ovum.) The ovaries also secrete hormones which help to regulate reproduction.

The Fallopian tubes are two narrow muscular canals extending from either side of the upper part of the uterine cavity to the ovaries. Each Fallopian tube has fingerlike processes at the free end that almost enfold the ovary.

The endometrium is the tissue lining the uterus and contains blood vessels which fill at appropriate times.

Process of Menstruation

Once each month an ovum matures and is discharged into the pelvic cavity. This is called ovulation. The mature ovum is picked up by the fingerlike processes at the end of the Fallopian tube.

person who needs it should have the advice of a physician, for with severe symptoms, medication may be prescribed.

The type of menstrual protection is a decision for the individual. Conclusions from one study[3] revealed that the use of tampons had no undesirable effects. There was no clinical, experimental, or theoretical support for believing that the internal use of tampons favors the retrograde flow of menstrual fluid and cellular elements.

Sanitary napkins should be changed frequently. Chemical changes can cause an odor when menstrual blood meets the air. Most girls perspire more when menstruating, hence bathing is necessary. Lukewarm tub baths are more relaxing than hot or cold showers.

Possible Pitfalls

When a girl looks careless and untidy, she is "advertising" her condition, therefore particular attention to daintiness and choice of clothes will counteract insecure feelings and boost her morale.

It is unwise to deplete physical strength by overworking, or by extremely active sports, and although some activity during menstruation is good, it can be overdone. Many women and girls wish to limit their activities during the earlier part of the period. A nurse should be able to work her usual shift of duty, but it might be wise not to do the family washing or bowl three games in addition to her day's work. Most women feel more comfortable not going swimming the first day or two; however, no valid excuse exists for going to bed and eliminating all normal activities. It also helps to avoid overeating, especially heavily fried foods, pastry, and candy. Lack of sleep and getting chilled may also contribute to discomfort during the menstrual period.

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[3] Robert E. Wheatley *et al.*, "Tampons in Menstrual Hygiene," *Journal of American Medical Association* (May 24, 1965), pp. 113–116.

ADDITIONAL TERMINOLOGY

Dysmenorrhea means *painful menstruation.* The pain or cramps may begin before the start of menstruation or may occur with the flow. Amount of pain varies from mild discomfort to severe attacks, but usually the maximum pain occurs at the beginning of menstruation and subsides when a normal flow is established. The pains and cramps are usually in the lower abdomen, but may extend to the back and legs. Other symptoms which may occur are headache, backache, irritability, weariness, nausea or vomiting. These troublesome symptoms may be less severe after marriage and childbirth.

Amenorrhea is the absence of menstruation. Amenorrhea is normal with preadolescents, women during or after the menopause, pregnant women, and at times, nursing mothers. Amenorrhea may be caused by a number of disorders, such as extreme anemia or endocrine imbalance, and should be reported to one's personal physician.

Premenstrual tension may occur a few days before the menstrual period when the hormonal change may cause the woman to feel blue or easily discouraged.

CAUSES OF DYSMENORRHEA

Dysmenorrhea may be increasing today despite better health education, which includes knowledge of body functions. Earlier generations of parents did not emphasize the normalness of menstruation, but sought to impress upon succeeding generations their own fears, misunderstandings, and even guilt or shame. Genuine understanding of body functions is an asset. A crucial factor in dysmenorrhea is the failure of women and girls to take proper precautions to avoid pain and discomfort. Dysmenorrhea is seen more often in the nervous, high-strung or neurotic female.

Organic conditions may cause dysmenorrhea; conditions such as displacement of the uterus, infantile uterus, ovarian cyst, glandular dysfunction, hormonal disturbances, fibroids or other tumors, and impairment or injury to parts of the organs, such as the cervix, uterus, or vagina. Medical care is needed for relief of pain.

Functional causes may frequently be eliminated by the individual herself. Constipation during menstruation will aggravate any distress. Fatigue, exhaustion, and lowered vitality are often contributing factors. High heels and poor posture place extra strain on the body. A chill or any illness may cause more discomfort at this time. Lack of physical exercise is the cause of pain in many cases, as is demonstrated by those who have taken exercise regularly and have had less pain.

Nervous tension and undue excitement can cause dysmenorrhea and should therefore be avoided if possible. Expecting to be sick will increase the likelihood of distress. Diverting attention to constructive activities and away from one's self may help. The nurse who is eager to give the best service to her patient and who wants truly to enjoy life will strive to follow normal precautions.

Warning Signals

The reproductive organs of women are complex and subject to many ailments, some minor and some serious. Every woman, and especially every nurse, should be alert to symptoms indicating that a doctor's diagnosis and treatment are needed. Any sudden change in established menstrual habits, such as great increase or decrease in time intervals between periods, will bear investigation. Other suspicious signs are bleeding occurring other than during normal menstruation; noticeable increase in flow of blood; need to change napkins twelve times daily, or flowing longer than seven days; repeated irregularity, very late one month, early the next, or skipping a period; and violently painful cramps. Any of these indicate the need to see the doctor for diagnosis and treatment.

Menopause

If false ideas about menopause are implanted in young minds, they are difficult to eradicate. Ideally, girls should learn about menopause when they learn about menstruation. Menopause is popularly called "change of life," for the menopausal syndrome reflects the time when the ovaries are no longer active, with consequent absence of ovulation and hormone imbalance. Menstruation goes on as long as ovarian hormones act on the uterine lining, but when the ovaries no longer function, the menses cease. Climacteric is the scientific name for the ending of reproductive life. Symptoms are usually not sharply defined, but indicate minor disturbances of the nervous and digestive systems. The woman may experience sudden, warm flushes on the skin, with profuse sweating; these so-called hot flashes indicate temporary disturbance of the circulation. Usually the menses disappear gradually by becoming more irregular or scantier, and finally stopping, but occasionally the menses cease abruptly. At this time some women gain weight, therefore the diet needs to be watched.

Menopause usually occurs between the ages of forty and fifty, and is sometimes delayed by hereditary factors, child bearing, or growths. It may begin early in women who are hardworking, unmarried, blond, or overweight. To meet this period successfully, good physical health is important, for health problems will make this change more difficult. Adjustment to the hormonal change will be eased with more rest, mild exercise in the open air, relaxation, and quiet recreation. A good mental attitude is exceedingly important. Many women unnecessarily fear that menopause will bring a loss of mental capacity or a loss of sexual desire. Both fears are groundless.

Menopause may be difficult to accept gracefully because it is taken as a sign of growing old, and because it may coincide with changes in the woman's home life. When her children marry and leave home, she feels unneeded, and such mental distress may add to her physical distress. The sensible woman should try to remember that the menopause is a natural body change. She can no longer bear children, but does she really want a new and tiny baby to care for? Nature is merely removing a function for which there is no further need.

Women should have medical support during this time and reassurance that the symptoms are related to the menopause, not something else. A nurse might well know the conditions to expect. Nevertheless, one trip to the doctor is usually necessary for a fully confident mental attitude that all is functioning normally.

QUESTIONS FOR DISCUSSION

1. Diagram the female reproductive organs (do not copy) and label each organ. Write a brief description of the function of each organ.
2. Write an essay or give a verbal report, explaining the process of menstruation to a young girl (daughter or younger sister).
3. List false ideas about menstruation and menopause which have been repeated from one generation to the next.
4. Each student nurse should know her responsibility toward giving out birth control information. Ask for clarification on this point from nursing supervisors.

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Chapter 6

DENTAL, EYE, AND EAR HEALTH

If the teeth, the eyes, and the ears are to function for a lifetime, they must be carefully guarded. The nurse should understand how to protect her eyesight, preserve her hearing, and safeguard her teeth. She should be able to detect the signs that indicate medical help is needed. If she can apply these principles to her own health, she will likely be able to instruct others.

Oral Hygiene

People who have false teeth will say that one's own teeth are far more satisfactory than the man-made product, and that all efforts to keep one's own teeth are worthwhile.

Teeth are meant to grind and cut food in small pieces, providing the first step in the process of digestion, but teeth are also necessary for clear, distinct speech. Bad teeth can cause illness and unpleasant breath. Because teeth are one of the first physical characteristics noted, attractive teeth are an asset and crooked, unsightly teeth a handicap.

Despite progress made in dentistry, many people lose teeth that should be retained. By the age of seventy, three fourths of all Americans have lost their natural teeth. If the current knowledge of diet and dental supervision were properly used, the amount of tooth decay and loss of teeth could be appreciably reduced. Good dental health care need not be expensive. If good dental health habits are established early and are consistently maintained, the most serious dental disorders will be prevented and the mouth will be healthy throughout life. Good dental care for children means eating wholesome foods, limiting intake of sweets, brushing teeth regularly, using fluorides, and visiting the dentist regularly. Good nutrition during the teeth-forming years is essential for good teeth. Sweet foods should be limited because acids produced by the fermentation of sugar cling to the teeth and cause dental decay. Early visits to the dentist will enable him to correct any defects which may be present. Children who drink fluoridated water from birth have about 60 per cent less dental decay than do those who drink unfluoridated water. In communities which do not have fluoridated water, parents should arrange for the dentist to apply a fluoride solution to the child's teeth at regular intervals.

Malocclusion (irregular teeth) may be inherited or acquired. Regular visits to the dentist will enable him to detect the first signs of serious malocclusion and to advise about orthodontia treatments. Uncorrected malocclusion can cause facial deformities, improper chewing, and periodontal diseases later in life.

Mouth hygiene recommended for adults is similar to that for children. Regular brushing of the teeth after meals keeps the mouth clean. Despite extravagant claims made for dentifrices for many years, it was not until about 1960 that researchers developed a dentifrice that would do more than clean the teeth. The American Dental Association has approved certain dentifrices as apparently helping to prevent dental decay. The dental profession recommends, a small, straight-handled, even-tufted toothbrush and electric toothbrushes. Mouthwashes serve only to rinse the mouth of loose debris, and for this purpose, water yields the same results. Adults also require adequate, balanced meals with a minimum of sweets for good dental health. The teeth should be protected. It is foolhardy to bite or crack nuts with the teeth.

Children lose teeth mainly because of dental decay, but after the teen years, periodontal diseases are the greatest cause for loss of teeth. However, the adult who has healthy gums and a complete set of teeth is less likely to develop serious dental diseases than if he had neglected his teeth during childhood.

Periodontal disease may be on the increase.[1] Controlling dental diseases depends to a great extent on what people are willing to do for themselves. The practical nurse can assist in reducing the incidence of dental disease in her community if she understands the attention that must be given to its control and prevention. *Periodontal* is a word derived from the Greek, the prefix *peri* meaning *around* and *dontos* meaning *tooth*. Hence periodontal diseases are diseases of the gums and other supporting structures of the teeth.

Gingivitis is inflammation of the gums and it may be caused by an accumulation of tartar deposits, injury, food packed between the teeth, or poor toothbrushing. To prevent gingivitis, brush the teeth and gums properly, have the dentist clean the teeth regularly, and eat well-balanced meals so that the gums will be properly nourished. If a person notices soreness or bleeding of the gums, he should immediately consult his dentist for advice and treatment. Neglected gingivitis may lead to another periodontal disease commonly called *pyorrhea*. Pyorrhea results when the inflamed gum tissues withdraw from the tooth, the ensuing pocket fills with bacteria and pus, and the support of the tooth is so weakened that it falls out. Early treatment of pyorrhea will usually prevent the loss of teeth. Good mouth hygiene and regular visits to the dentist are the best means of preventing pyorrhea.

Vincent's infection, sometimes called "trench mouth" is a disease which attacks the gums and then spreads to other soft tissues of the mouth and throat. It may be caused by lowered resistance, with unhygienic conditions as a contributing factor. Because the early stages resemble gingivitis, the infection is often neglected. The conditions spread rapidly and the longer treatment is postponed, the longer the time required for effective control.

Select your dentist with care, make regular appointments, and give him your full cooperation. A reputable dentist has graduated from a recognized dental school which meets the requirements established by state laws. Rapid progress is being made in dentistry, and a good dentist makes an effort to keep up-to-date. He uses x-ray in diagnosis; he keeps accurate records for each client; his office will be immaculate, and he sterilizes the instruments he uses. However, do not allow a fancy office to be the only basis for evaluation.

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[1] As reported by public health dentists in Florida, *Florida Health Notes* (April 1965), p. 67.

Dentists, like doctors, may be general practitioners or may take further training to specialize in one phase of dental work. The main speciality areas in dentistry are the following: *orthodontics*, straightening of irregular teeth and correction of malocclusion of the jaw; *periodontics*, treatment of diseases of tissues around the teeth; *oral surgery*, surgical treatment and repair of teeth involving cutting into the jawbone; *pedodontics*, treatment of dental ills of children; and *prosthodontics*, construction of special appliances to compensate mechanically for such deficiences as a cleft palate.

Good general health and oral health go together, for physical and social well-being do not exist when decayed or diseased gums are present. Oral cleanliness, good diet, and regular dental care are essential to the maintenance of healthy gums and teeth.

Care of the Eyes

Sight is one of man's most precious prossessions. Lost eyesight cannot be replaced by medical science, hence we must give our eyes proper care if we expect them to serve us well during our lifetime. Our way of life makes constant, severe demands on the eyes. People have become aware of the need for good vision, and the number of people wearing eye glasses has risen. Formerly, three out of every 100 students wore eye glasses. Now eye glasses are worn by thirteen out of every 100 high school students, and twenty-six out of every 100 college students.

What can you, the student nurse, do to help preserve your own eyesight? Observing good general health habits will help your eyes to function well; such habits include sufficient outdoor recreation, proper food, and plenty of sleep. Maintain high standards of cleanliness. Eyes are easily infected, therefore wash your eye lids and the surrounding skin area carefully and frequently. Use plenty of soap and water, and dry well with a soft towel. Each family member should use his own washcloth and towel. Keep fingers away from the eyes, especially when the hands are soiled.

Protect the eyes from possible injury from ultraviolet rays and avoidable glare. Accidents rank high among the causes of blindness, therefore industry personnel continually press the campaign for safety of the eyes. Special goggles and glasses are provided for workers whose jobs carry a risk of eye injury. Parents are usually careful to keep eye-injuring materials out of the reach of toddlers, yet children do suffer sight injuries, and both children and adults may be blinded by auto accidents, blows, or chemicals.

Any foreign particle lodged on the eyes or the inside of the lid should be removed carefully, not dabbed at, with the corner of a handkerchief. In your nursing instruction you will learn the correct procedure. Eyes must also be protected against ultraviolet rays, which may be direct from the sun, reflected from snow, or produced by a sun lamp. Sunglasses are worthwhile protection if they are of good quality and optically safe, but cheap sunglasses may be harmful.

Glare causes discomfort or distress to the eyes and may come from direct light, from contrast between light and dark areas, or from reflection from polished surfaces. A shiny desk top reflects enough glare over an eight-hour period to produce eye fatigue.

Use your eyes in a good light, for inadequate light and glare cause the eyes to work harder, thus resulting in eye strain and fatigue. Reading or working in a poor light does not cause blindness, but it does affect the efficiency of vision. A good light on your study desk will encourage concentration and good posture and helps to prevent sleepiness and headaches. Providing a good light for your patient will help him to conserve his strength. His diversional project or the book he reads will tire him less and benefit him more if he has a good light. A good light furnishes a sufficient quantity of light without glare. It is a soft, diffused light, evenly distributed. The quantity of light is measured in footcandles. One footcandle equals the light from one candle, held at a distance of 1 foot. For general room lighting the minimum illumination needed is 5 to 10 footcandles. In addition, local light is needed to see the task at hand; the amount of extra light needed will depend upon the exactness or closeness of the activity. Researchers in lighting recommend 20 to 30 footcandles of light for casual reading, 50 to 70 footcandles for prolonged reading or study, and 100 to 200 footcandles for fine sewing or hobbies with small details.

Light should fall upon the task. On a study desk, place the portable lamp 12 inches back from the front edge, and 15 inches to the left of the work center, for a right-handed person (15 inches to the right for a left-handed person). For simple reading the light may come from either side, over the left or right shoulder. It is important for the light to fall on the book. Figure 6–1 shows the differences between a good light and a poor light for the study desk.

Hold reading material at the proper angle, approximately 12 to 18 inches from the eyes. When sitting upright, the book should be at an angle between 45 and 60 degrees. Reading in bed frequently produces eyestrain because the book is not held at the comfortable angle and the light may be inadequate.

The nurse should assume the responsibility of adjusting the light by which her patient reads. The bed patient should be in a semisitting position, with his book held or propped on a level with his eyes and the light falling on the book from the direction of the head of the bed, or from the bedside table located slightly behind him. The direct light source should be kept out of his line of vision. During illness and convalescence, the eyes are especially susceptible to fatigue.

To read while riding in a moving vehicle is extremely fatiguing. The jolting action continually moves the reading material and varies the intensity of the light. This places an enormous strain on the eye muscles.

Rest your eyes at intervals when reading or studying. Few people can read steadily for more than an hour and a half without beginning to lose retention ability. One may continue to read,

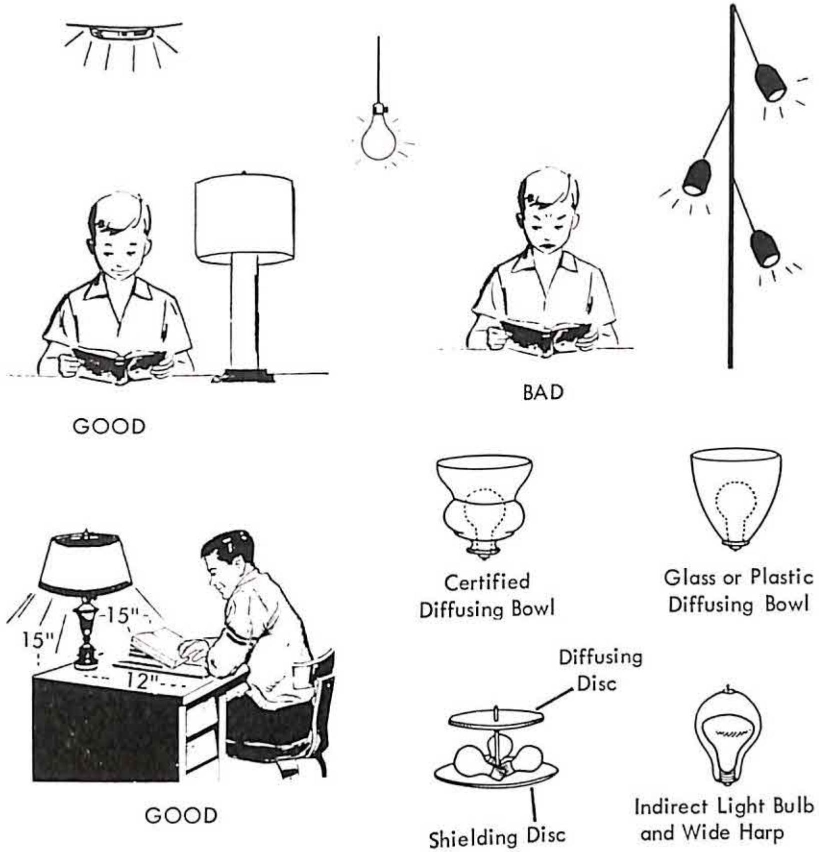

Figure 6–1. Good and bad lighting for a study desk; under-the-shade devices which provide good lighting.

but comprehension wanes. A twenty-minute rest period is time well invested. Close the eyes, look at a blank wall or distant object, or turn to another activity for a short while. The same principle applies to automobile driving. After driving for an hour and a half, stop the car and rest the eyes for twenty minutes. You will be a safer, more reliable driver when you continue on your route.

Refrain from self-medication. Cleverly advertised eyewashes may sound tempting but should be avoided; normal eyes do not need treatment. If dust settles on the eyeball, tears will form and the blinking eyelids carry the tears gently over the eyeball. If something is wrong with the eyes, help from a physician is needed. Self-medication may only postpone seeking professional help. Warning signs that the person should see an eye specialist are important for the nurse to recognize. Symptoms of trouble are persistent headaches, discomfort or pain, or watery or inflamed eyes. Vision difficulties include receding near vision, loss of side vision, double vision, and blurred or foggy vision. Some people who do not see well will squint, thrust the head forward, or cover one eye to see. On the other hand, if near vision does not recede after the age of forty-five, this could be an indication of trouble.

There are two periods in life when the eyes should have special attention: during the early school years and again at middle age. Most schools give rudimentary eye examinations to elementary school children. Parents are informed if the child needs further testing or corrective glasses. A young child has strong focusing muscles which do not tire easily, yet a farsighted youngster needs glasses to give his muscles a rest. Success at school greatly depends on reading ability, which depends on good vision.

In middle age the lens of the eye loses some of its elasticity and does not focus as well as at an earlier age. Normally, near vision recedes between the ages of forty and forty-five. If this does not happen, it could be an indication that cataracts are forming.

Eye examinations should be a routine part of the regular physical examination. If neglected, a minor defect in vision may become a permanent and incurable loss of vision before the person knows it. Two major causes of blindness in adults, cataracts and glaucoma, can begin with minimal symptoms and progress rapidly before the condition is identified. Because the eyes act as barometers, the physician may read the signs which foretell serious conditions.

The nurse should understand the functions of the different eye specialists.

The *ophthalmologist* or *oculist*[2] is a medical doctor who has specialized in the diagnosis and treatment of defects and diseases of the eyes. He performs surgery when necessary or prescribes other types of treatment, including glasses.

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[2] *Oculist* is an old term sometimes still used by the lay public.

The *optometrist* is a licensed, nonmedical practitioner who measures refractive errors of the eyes, that is, he measures irregularities in the size and shape of the eyeball or surface of the cornea, and eye muscle disturbances. In his treatment the optometrist uses glasses, prisms, and exercise only. He is licensed to prescribe eye glasses.

The *optician* is a person licensed to grind and fit eyeglasses on the request of a medical eye physician or optometrist. In addition, some opticians also fit contact lenses on the prescription of the ophthalmologist or optometrist.

Care of the Ears

About one eighth of all impressions reach us through the ears. Deafness has been regarded as the most handicapping of all the nondisabling handicaps. Deafness may be more severe than blindness. Blind people have been known to find success in business, law, and music, but in the past, few deaf people gained this degree of adjustment and accomplishment. Those who succeeded usually had developed skills before losing their hearing. Today's education of the deaf child strives to improve his communication with the world around him so that the child is not forced into unhealthy isolation.

A child's hearing problem should be recognized early. The baby responds to noise in the first few months of life by stopping movements and holding still, or by turning his head in the direction of the sound. If the baby makes no response to sound by the age of eight months, parents may suspect a hearing problem. If the child is not learning to talk when he is two years old, he may not be hearing properly. Many hearing problems can be arrested with early treatments. The family can help a child with impaired hearing to learn to compensate and to communicate. His school teachers can help him to avoid failure. If he learns to read lips and sit in the front of the classroom, the hard-of-hearing child may be able to attend regular school. Unrecognized hearing difficulties may cause tension, personality defects, poor performance, or behavior problems.

Figure 6–2 is a diagram and description of the structure and function of the ear. A nurse should be aware of the potential danger sources for loss of hearing. The nurse who understands the structure of the ear can readily see that the "common cold" is not insignificant. Middle-ear infections are associated with colds, and many contagious diseases can cause hearing difficulties. Because the eustachian tube, lined with muscular membrane, is located between the pharynx and palatine tonsils, infection travels easily from throat to ear. In childhood the passage is shorter and wider,

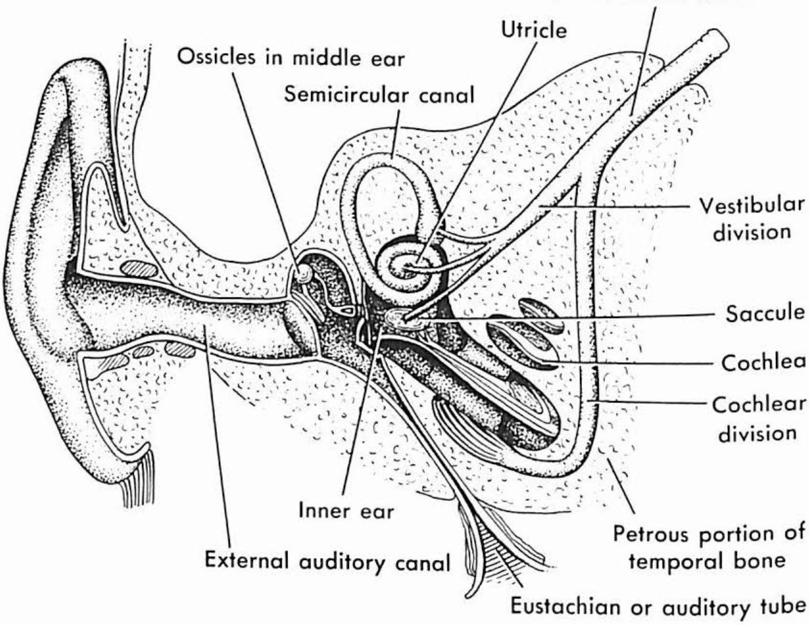

Figure 6–2. Structure of the ear. (From Diana Clifford Kimber *et al.*, *Anatomy and Physiology*, 15th ed., The Macmillan Company, New York, 1966. By permission of The Macmillan Company.)

which allows better drainage if infection occurs but which also provides easy entrance for infection from the nose or throat. For these reasons an infection of the nose or throat may lead to ear trouble. Preventive measures depend on medical attention to the infectious process. The person suffering from a cold should observe precautions, such as blowing the nose gently, with both nostrils open. Vigorous nose blowing may force infection from the nasal passage into the middle ear, through the eustachian tube.

The accumulation of wax in the outer ear can limit hearing, and such accumulations should be gently removed by a physician. Clumsy removal of the wax can result in painful boils in the canal or even piercing of the delicate eardrum. A corner of a wash cloth rolled into a point will remove excess soft wax from the outer portion of the ear canal without danger of injury to the ear drum. Never pick the ear canal with a toothpick, hairpin, or similar object, which could puncture the ear drum or cause infection. Avoid generous soaping of the ear canal because soap cuts and hardens the wax, making it difficult to remove. The outer ear needs protection from the weather because it is subject to sunburn or frostburn.

Prolonged exposure to continuous, excessive noise causes hearing problems. The highest incidence of deafness occurs among people employed in the noisiest industries, that is, among machinists, coppersmiths and boilermakers. A reved-up jet motor on the ground produces a terrific noise. Man's capacity to make noise may have exceeded his ability to absorb noise. Loud, explosive noise can rupture the ear drum. The noise is not overly severe if normal conversation is possible, but if conversation is impossible, then the noise may be excessive enough to lead to hearing difficulties.

Ears should be protected while diving or swimming under water. Deep diving suddenly increases the pressure on the ear drums and can depress them. When a person has a slight cold or ear infection, the eustachian tube is partially blocked by infection. At this time air pressure does not equalize readily, hence swimming should always be avoided when a person has a cold, ear infection, mastoid infection, or damaged ear drum. Usually when water enters the external canal, it drains out quickly. Prolonged soaking may render the wax ineffective and leave the ear drum unprotected. Once a fungus condition is established in the ear, effective cure is difficult. Preventive measures would include the constant use of ear plugs when swimming and prompt treatment of all ear infections.

A baby may indicate signs of ear trouble by turning his head in an unusual way; by attempting to hold the ear that bothers him; by a high fever; or by crying and being especially fussy.

An adult should not postpone seeing a doctor about his hearing if he frequently asks that questions be repeated; if he follows conversations by watching lip movements rather than by hearing words and phrases; if he turns his head in order to direct sound toward his ear; if he misses words and phrases in normal noise situations, such as lunch time in a restaurant; or if he develops ear ache, headache, or dizziness. Loss of hearing caused by age may begin in the middle or late fifties. Research may yet disclose ways to prevent or to postpone this hearing loss.

The *otologist* is the medical doctor who has specialized in the treatment of diseases of the ear. A hard-of-hearing or deaf person should consult an otologist for a proper hearing evaluation to determine if he can be helped by surgery or by a hearing aid. Surgical techniques to postpone hearing loss have greatly improved, and some people who were resigned to a lifetime of deafness may continue to hear. Mechanical hearing aids are available which will help some, but not all people with defective hearing. Few people know what kind of hearing aid they need or could use, hence the hard-of-hearing have been easy targets for unethical salesmen. High-pressure salesmen have sold hearing aids at grossly inflated prices. In the future, more states will pass laws which require licensing of hearing-aid salespeople and require that hearing aids be sold only on prescription from an otologist or a qualified audiologist.

An *audiologist* is a professionally trained person, usually with a doctorate degree. His profession is the diagnosis of the types and degrees of deafness and the re-education and rehabilitation of the deaf and hard-of-hearing.

The medical profession has established various hearing centers which have special equipment and qualified staffs to assist the ear specialist in hearing evaluation. Audiometer tests have been developed for accurate measurements of hearing ability. These should be conducted in soundproof rooms to eliminate background noise and other sounds that would invalidate hearing measurement. Reputable hearing-aid dealers will cooperate with the otologist or audiologist to provide the most effective hearing aid. Ethical dealers will also arrange for replacement of parts.

QUESTIONS FOR DISCUSSION

1. Does the water you drink contain fluoride?
2. If time allows, arrange for a dental hygienist to speak to the class on good oral hygiene.
3. Contact the home-service department of your local electrical utility and ask for a demonstration on good home lighting.
4. Using a light meter, check the number of footcandles of light available for studying and for various work areas in your home and in the hospital. Does the lighting meet the standards recommended?
5. Appoint a committee to investigate hearing aids. What is the price range?
6. Where are audiometer tests given in your community?

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Chapter 7

STIMULANTS AND NARCOTICS

The nurse should understand the potential benefits and problems that can arise from the proper use of narcotics and stimulants, or the improper use of them. Used wisely, they offer many therapeutic values. Used unwisely, they cause great harm to the individual and to society. Drugs can gain control of a person's life with disastrous results. Prevention is more effective than treatment.

Definitions are given here to avoid confusion, and to clarify the discussion.

A *narcotic* is a drug that acts on the central nervous system to induce sleep by controlling pain. Narcotics are dangerous because they can become habit forming and lead to addiction. Examples include morphine and Demerol.

A *stimulant* is a drug that increases activity of the brain and spinal cord. Examples are caffeine and benzedrine.

A *depressant* slows down the activity of the nervous system. Examples include alcohol, morphine, and opium.

Hypnotics are drugs used to induce sleep. They tend to lose effect if used continuously. These drugs may be habit forming, and overdosage is common. Examples include Doriden, and depending upon dosage, the barbiturates.

Sedatives are drugs that promote relaxation and rest, but not necessarily sleep. In large amounts, sedatives depress circulation and respiration. They are effective in relieving insommia if pain is not severe. Examples include barbiturates, opiates, and alcohol.

Tranquilizers are drugs that have a quiet, relaxing effect on patients who are worried, anxious, and overactive. Correct dosage will calm the patient without necessarily depressing the entire central nervous system, or will elevate his mood without noticeable stimulation.

Tea and Coffee

The stimulating effect of tea, coffee, cocoa, and cola drinks may be beneficial if the beverages are consumed in moderate amounts, and at the right time. Caffeine is the stimulant found in coffee and tea. An ordinary cup of coffee or a strong cup of tea contains approximately one and one half grains of caffeine. Cocoa contains theobromine, which is similar to caffeine in chemical structure and physiological action, but less stimulating to the brain.

Caffeine has specific effects on the body. It stimulates the thinking functions of the nervous system. Speed of reaction is increased, although accuracy is possibly reduced. It tends to relieve fatigue and also serves as a heart stimulant, first increasing the rate of heart beat, then slowing it which is a normal after effect of stimulation. Caffeine may cause the blood pressure to rise, then drop, and may also increase the action of the kidneys. As a medicine, caffeine is used to produce mild cerebral stimulation; to stimulate the respiratory center; and to counteract some narcotic drugs.

Physicians often limit or forbid drinking of coffee by persons with cardiovascular disease or nervous excitability. Consuming an excessive amount of caffeine may provoke "coffee nerves," which are characterized by restlessness, irritability, and insomnia. This may also include headaches, heart palpitations, and dizziness. The reaction of individuals will vary greatly. Some people cannot sleep if they drink one cup of coffee before retiring, but others are not affected. Caffeine induces similar reactions in children. A child's sensitive system does not need overstimulation, hence any stimulating drug is highly undesirable. Drinking tea, coffee, or colas also tends to crowd out of the diet necessary growth and energy foods, such as milk and fruit juices. These beverages may refresh a tired person and help a busy, responsible person to fulfill his obligations, but their use should not be abused. The housewife or office worker whose coffee break lasts all day is building toward trouble.

Alcohol

How you personally feel about drinking alcoholic beverages will be influenced by your home training, religious beliefs, and past experiences. Many social and cultural factors are involved. Because the nurse should be informed realistically, let us examine the known facts about alcohol.

History

Early references to the use of wine may be traced through history. Biblical accounts show that wine was used in small amounts by the Hebrews and early Christians. The miracle of Cana took place when the wine at the wedding feast was consumed and more was needed immediately. Drunkenness, however, also occurred, and was strongly condemned; history consistently reveals this view. Luther sharply criticized his fellow Germans for excesses in drinking. The seventeenth-century Calvinists and the early Puritans permitted the use of drinks containing alcohol, but always condemned drunkenness. The New England Puritans did not consider the ordinary use of alcohol to be sinful; it was excessive drinking that they regarded as immoral. Drunkenness meant loss of time from work. It was also debasing, making men like animals. Up to 1800, beer and wine were part of most social gatherings in the colonies. However, as rum and whiskey became used more widely, people began to doubt the popular theory that alcoholic beverages relieved fatigue or protected against heat and cold. At the close of the eighteenth century, peoples' ideas changed.[1] Leaders began to advocate abstinence, and "temperance groups" were formed. Efforts to legislate against the use of alcoholic beverages continued for many years, until finally Congress passed the Eighteenth Amendment, which forbade the manufacture and sale of alcoholic beverages. This was in force from 1920 until 1933, and debate is still continuing as to whether prohibition was effective or ineffective.

Because citizens of a country are proud of their own products, it became a matter of pride for a citizen to drink the beverage produced in his own country. The Englishman preferred his ale; the German his beer; the Frenchman his wine; and the American became noted for his cocktail parties. A negative outgrowth of these national traditions is the problem of alcoholism.

DEFINING ALCOHOLISM

Defining alcoholism is difficult because no sharp line separates the alcoholic from the social drinker. A general distinction would be that the social drinker can control his drinking, whereas the alcoholic cannot. The alcoholic drinks in excess of customary diet and social standards of the community; his drinking interferes with health, social life, and work. His personality is affected and he cannot carry on a normal life (see Figure 7–1).

ALCOHOLISM A MAJOR PROBLEM TODAY

Alcoholism now ranks fourth among the nation's health problems, outranked only by heart disease, cancer, and mental illness. Approximately 6 per cent of the adult population of the United

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[1] Raymond McCarthy and Edgar M. Douglass, *Alcohol and Social Responsibilities* (New York: Thomas Y. Crowell and Yale Plan Clinic, 1949), pp. 8–16. Also repeated in Raymond McCarthy, *Facts About Alcohol*, Guidance Series Booklet 120 (Chicago: Science Research Associates, Inc., 1951).

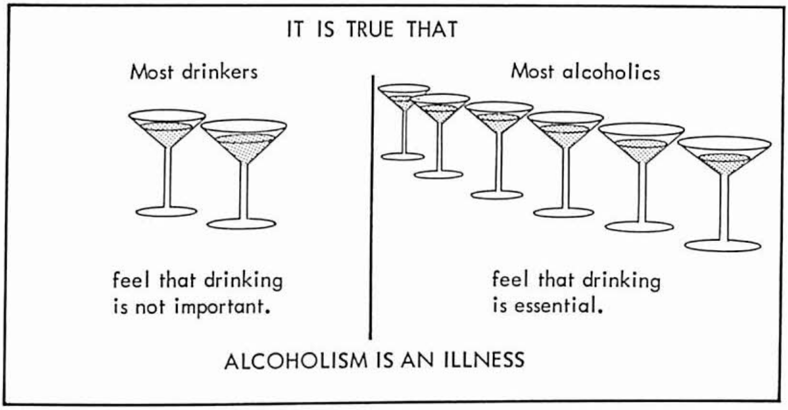
IT IS TRUE THAT
Most drinkers
feel that drinking is not important.
Most alcoholics
feel that drinking is essential.
ALCOHOLISM IS AN ILLNESS

Figure 7–1. Social drinking or alcoholism? (From Raymond G. McCarthy, *Exploring Alcohol Questions,* Leaflet 5. © 1956 by Journal of Studies on Alcohol, Inc., New Brunswick, N.J. By permission of Journal of Studies on Alcohol, Inc.)

States are recognized alcoholics. (In France, 10 per cent of all adults are involved.) The percentage may not be increasing, but the number of alcoholics rises as the population increases, and it is estimated that more than 5 million Americans are alcoholics. Alcoholics are found in every walk of life, on every level of society, and in all economic circumstances. Very few (only 7 per cent) are on skid row. Alcoholism seems to be more prevalent among the lowest and highest social strata. Recent figures indicate a rising incidence of alcoholism among women. Younger people are seeking help, indicating that people are possibly becoming alcoholics at an earlier age.

Some people consider automobile accidents as the nation's leading health problem. The National Safety Council has held alcohol to be at least partly responsible for from 30 to 50 per cent of the annual traffic accident fatalities. One study[2] reported that more than 50 per cent of the fatal traffic accidents involved

[2] Roche Laboratories, *Aspects of Alcoholism* (Philadelphia: Lippincott, 1963), p. 51.

a drinking driver. Another study[3] on causes of violent death showed that ethyl alcohol was responsible in 49 per cent of all auto casualties, 31 per cent of all homicides, 36 per cent of suicides, and 39 per cent of all deaths caused by such accidents as those involving burns, carbon monoxide suffocation, drowning, electrocution, and falling.

Attempts have been made to estimate the cost of alcoholism to industry and to the government. One general estimate places the financial cost well over $1 billion—the cost to industry for the alcoholic's absenteeism and reduced job efficiency, the cost of maintaining county and local jails, and the cost for help extended to families of alcoholics. No attempt can be made to estimate the cost of personal suffering.

Reasons for Increase

Increase in alcoholism may be associated with social changes. Religious controls have become more lenient, and the decision to drink is often left to the individual. People are more tolerant of alcoholic-influenced behavior than in former years. At the same time, social pressures for drinking have increased. One is offered liquor everywhere—at social affairs, during business hours, at conferences, and at government functions. (One Methodist minister did not quickly forget that his teen-age son had his first alcoholic drink at the governor's mansion.) Alcohol occupies an important place in our society. It is glamorized by advertisements and by movies and television, giving the young person the impression that alcohol gives distinction, that a drink answers the need in time of crisis.

TEEN-AGERS AND ALCOHOL

Unfortunately many teen-agers experiment with alcoholic beverages, some at ages as young as thirteen or fourteen. It is not

[3] *Ibid.*, p. 47.

unusual for an adolescent to have self-doubts and to feel unsure of himself in new social situations. Drinking alcoholic beverages may give him (or her) false self-confidence and remove important self-restraints.

Parents and teachers should assume the responsibility for giving teen-agers facts and information about alcohol. A father would not readily turn over the keys of the family car to his son without being assured that the boy knew how to drive the automobile. Yet he might permit his son to attend social functions where alcoholic beverages are being served without knowing if his son is realistically informed about the potential effects and results from drinking. With teen-agers, it is more effective to emphasize present rather than future risks.

Alcohol Affects How a Person Feels

With the first drink of alcoholic beverages, the person is briefly stimulated. His exhilaration and sense of well-being is due to the depressant action on the brain cells that control restraint. The person has a feeling of well-being and thinks that he is a great wit. He does not realize that he is less alert. With more drinking, his face becomes flushed, his thinking confused and dazed, his body movements become uncertain, and he may be silly, angry, irritable or remorseful. If enough alcohol is ingested, he becomes dead drunk and loses power of thought and body movement. The amount of alcohol is gradually reduced as the body eliminates it. The hangover results from the effects of alcohol on the body tissues; its symptoms include a headache, stomache ache, thirst, fatigue, sweating, weakness, and heart palpitation.

Alcohol in the Body

Alcohol is a depressant; it causes the heart beat to slow and the blood pressure to drop. The person relaxes. Actually, a small amount of alcohol does little harm, and it may prevent blood

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pressure from rising during tension periods. Some people find it difficult to relax at the end of the day's work. Evidence indicates that a small amount of alcohol makes the aged more comfortable. Problems develop because people do not stop after drinking a small amount.

Alcohol affects the circulation. Blood vessels at the body surface dilate, resulting in a flushing of the skin and a sensation of warmth, although the deep body temperature is lowered. This action can be serious if the person is exposed to cold.

Small amounts of alcohol have little effect upon digestion, but large amounts of alcohol retard the chemical changes of digestion. However, the chief effect of alcohol in the body is that of the depressant action on the central nervous system. The higher nerve centers of the brain are affected, those that control inhibitions, restraints, memory, thought, judgment, and self-control. Larger quantities of alcohol paralyze the center that controls motor and sensory functions. Eventually, this leads to unconsciousness. This last stage is similar to that obtained in ether anesthesia.

Absorption of Ingested Alcohol

Alcohol is absorbed in the body immediately, without digestion. It is absorbed directly into the circulatory system from the stomach, the small intenstine, and the colon. Alcohol mixes readily with water, dilates the arteries, hence rapidly distributes itself throughout the body fluids (Figure 7–2). Oxidation and elimination occur more slowly. Only a small amount, probably 2 per cent, of the alcohol consumed is eliminated from the body through the lungs and kidneys. The remainder of the alcohol is oxidized in the body, becoming carbon dioxide and water. The first step in the detoxication of alcohol takes place in the liver, at a limited and a fixed rate. Thus the effects of alcohol last far longer than the time of active absorption.

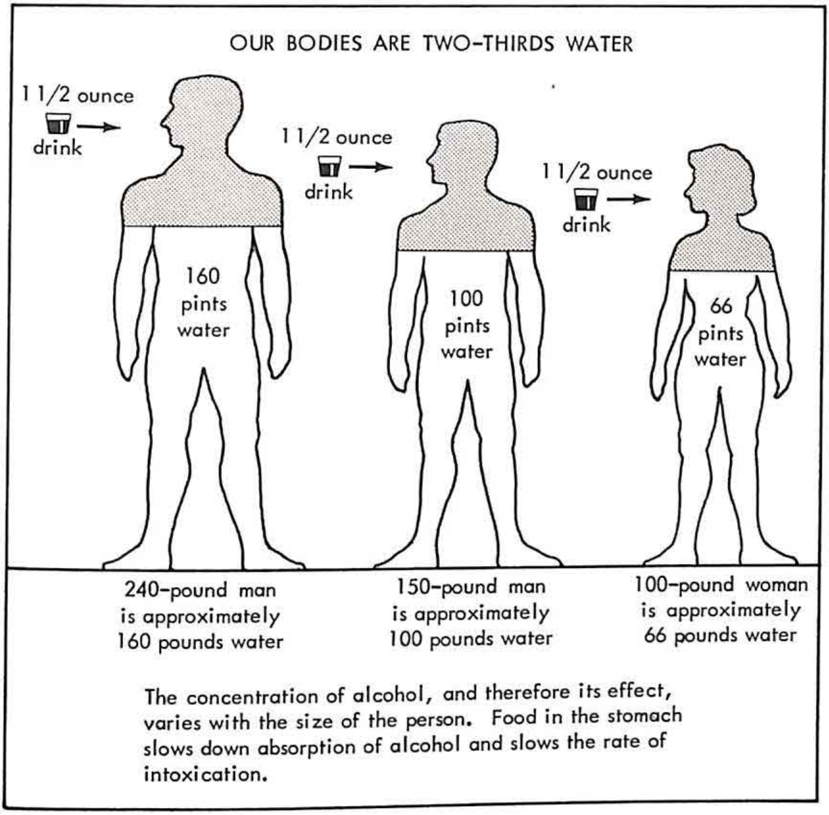

Figure 7–2. Facts about drinking. (From Alcoholism & Drug Addiction Research Foundation, *It's Best to Know About Alcohol.* Copyright 1961 by Alcoholism & Drug Addiction Research Foundation, Toronto, Ontario, Canada. By permission of Alcoholism & Drug Addiction Research Foundation.)

Death from Alcohol

Death attributed directly to alcohol occurs only rarely because the human body has built-in defenses against such a possibility. The fatal concentration of alcohol in the blood is above 0.50 per cent, but before that point is reached, the individual passes out.

Ingested alcohol distributes itself rapidly throughout the body tissue. The percentage of alcohol in the blood is definitely related to the degree of intoxication. With less than 0.05 per cent of alcohol in the blood, the individual feels little change. With between 0.05 and 0.15 per cent, many people are disturbed in movement and speech; some feel delighted and devilish. Most people are intoxicated with 0.15 per cent or more. With a concentration of 0.15 to 0.30 per cent, the person is usually dizzy and delirious. With a blood concentration of 0.30 to 0.40, he is probably dazed and dejected. When the concentration reaches 0.40 per cent, he passes out. At 0.50 per cent, he may die from deep anesthesia which completely paralyzes the respiratory center. Ordinarily, a person becomes unconscious before drinking the fatal amount. The danger comes if the person quickly drinks a pint or more of undiluted whiskey just before passing out. Then the blood concentration may go up to the fatal 0.50 per cent while he is unconscious.

DISEASES COMPLICATING ALCOHOLISM

The heavy drinker who neglects other foods often becomes seriously ill. Malnutrition is usually the crucial factor. Alcohol is a ready source of energy, yielding 7 calories per gram of alcohol, but these are empty calories, with no minerals, vitamins, or proteins. When the body lacks the essential foods over a long period, many illnesses can develop.

Cirrhosis of the liver is probably a dietary situation, caused by faulty nourishment. Sometimes nondrinkers develop this disease, but it is eight times as frequent among chronic alcoholics as it is among the general population.

Alcoholic tremor is one of the most common of physical changes associated with excessive drinking. The tremor may persist long after the patient has ceased to drink. Peak intensity is reached upon complete alcohol withdrawal.

Delirium tremens are alcoholic tremors in their most severe form, including violent shaking and hallucinations. The person is mentally distressed, and may experience a rise of temperature, loss of appetite, nausea, and constipation. This usually occurs after the first and before the fifth day of total abstinence. The exact cause for metabolic disturbances with alcoholic withdrawal is not explained. Not all heavy drinkers have delirium tremens, but nondrinkers never do.

Deficiency diseases may occur after long periods of neglected diet. If a person's diet lacks thiamine, vitamin B_1, he may develop a disease of the nervous system and circulation. The absence of niacin, another of the vitamin B group, causes pellagra, which is characterized by mental disorders, diarrhea, and roughening of the skin.

Heavy drinkers are likely to neglect personal hygiene and good diet, hence the body efficiency declines. Because of altered circulation and nutrition, a person is susceptible to many illnesses. He may contract tuberculosis or circulatory diseases. His mental functions become sluggish; he is exposed to many diseases; and his resistance is lowered. Recovery is slow.

Stages of Alcoholism

The medical department of a large industrial concern developed a *Profile of Alcoholism* outlining the progressive stages of alcoholism.[4] From social drinking, the first stage, the person experiences relief from inner tensions. With dependent drinking, the second stage, the person becomes dependent upon daily alcoholic support. In the third stage, the prealcoholic stage, drinks are downed hastily and on the sly. By the fourth stage the drinker begins to lose control of his drinking and habitually indulges to excess in alcoholic beverages. He is frequently drunk in the evening and on his days off, and his relations with his family and friends suffer.

By the fifth stage the drinker is considered to be an alcoholic and needs a morning drink to face the day. He rationalizes his drinking behavior, offering alibis about his alcoholic intake; he indulges in solitary drinking; and he changes the pattern of his drinking.

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[4] *Ibid.*, pp. 13–14.

The sixth stage is that of the chronic alcoholic, and is characterized by prolonged periods of intoxicatioin, or "benders." These occasionally result in delirium tremens and his first hospitalization.

Continued excessive drinking finally produces physical effects, and the final phase of alcoholism, the seventh stage, is classified as organic deterioration. In this stage the drinker may develop one or more of the complicating diseases of alcoholism, such as cirrhosis of the liver, peripheral neuritis, and severe malnutrition.

Many warning signs indicate that the social drinker is close to alcoholism. Any of the preceding phases described should be a warning. These would also be significant: he goes on frequent drinking sprees; he misses time from work; he spends money on liquor instead of more essential things; he finds that people close to him are critical of his drinking; or he drinks alone or in secret. He may be an alcoholic or merely close to it if he feels the need for a drink at certain times of the day; if he has to have a drink the first thing in the morning; or if he has blackouts or amnesia during drinking sprees and the next day cannot recall what happened.

Causes of Alcoholism

Medical science cannot fully explain why some people become alcoholics and some heavy drinkers do not. About 10 per cent of all alcoholics show signs of addiction with the first drink. Physical make-up, or body chemistry, may be involved.

Alcoholism is a disease, a chronic, progressive disease that almost certainly has an emotional basis. The alcoholic deals with his anxiety in times of stress by drinking. It is a means of escape from problems of the moment. He feels unwanted, unloved, unsuccessful, frustrated, angry, or fearful. Under the influence of alcohol, his problems disappear.

Studies of the lives of alcoholics[5] show that many had an unhappy childhood; few had both parents present; almost none had a relaxed and affectionate family life. Problem drinking of parents is frequently mentioned by alcoholics. An alcoholic may manage to keep his marriage alive and hold a job, but closer inspection reveals much emotional chaos in his life. Many wives of alcoholics demonstrate serious neurotic tendencies, and helping the alcoholic may necessitate helping the family, too.

HELPING THE ALCOHOLIC

When an individual first shows the symptoms of alcoholism, his family is often hostile, critical, and scornful. Because he does not receive the help and encouragement that he needs, his feelings of inadequacy only deepen and his need to seek escape by drinking increases. Generally, the family of an alcoholic woman shows less tolerance than the family of an alcoholic man. It is difficult to shield a child from a drunken mother. The alcoholic woman is likely to drink in secret in the privacy of her home. The alcoholic man probably goes to the neighborhood bar.

Genuine help for the alcoholic stems from taking an objective view of the problem, and seeking the hidden motives for his need to drink. Family members are seldom able to be objective and are usually unsuccessful in handling alcoholism without guidance from the outside. Seeking outside help may be the first and most important step in helping the alcoholic and his family.

Medical Help for the Alcoholic

Various kinds of treatment exist for the alcoholic, but not everyone will respond to the same treatment. Most alcoholics must first have the kind of medical care that only a physician can provide. Certainly the alcoholic should be evaluated medically to detect any underlying disease that requires attention. After a thorough and complete evaluation, often including psychiatric examination, the physician determines the method of treatment best suited to the patient. The treatment of the acute phase of alcoholism is primarily medical treatment. Treatment of the chronic condition is largely psychological and educational, because the person must learn to live without alcohol.

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[5] *Ibid.*, p. 32.

The physician knows that the rehabilitation of the alcoholic may possibly require two years and that his condition probably took ten to fifteen years to develop. The doctor does not immediately tell the patient that he must learn to live without alcohol. Important new discoveries in psychopharmacology enable the physician to manage some of the principal emotional and physical factors associated with the disorder.

A growing number of social, civic, and religious agencies also support the physician in his effort to help the alcoholic.

Community Responsibility

If the law-enforcement, religious, and social agencies unite their efforts and work together, the greatest good will come for the alcoholic and his family. In many communities civic leaders are working toward the revision of laws that would give the alcoholic care and treatment, instead of jail sentences. A chapter of Alcoholics Anonymous (AA) is found in almost every community. Alcoholics Anonymous is an informal fellowship of men and women who have personally known the problems produced by alcoholism. Their purpose is to become sober and to stay sober. Through mutual aid they help other alcoholics to stop drinking, and in the process they strengthen their own sobriety. This form of group action therapy is successful for many people, but not for everyone. The nurse should remember that, valuable as it is, Alcoholics Anonymous is not an organization of professionals. It should not be considered a complete form of therapy. The greatest good is accomplished when Alcoholics Anonymous cooperates with the physician and treatment center.

An allied organization is the Al-Anon Family Group, designed to help the family of the alcoholic. The family may also receive information and supporting help from one of the many Alcoholism Information Centers, which serve as a clearing house of information on alcoholism. These centers are affiliated with the National Council on Alcoholism (NCA), a voluntary agency with headquarters in New York City and councils in sixty-one cities. Usually these centers also have on file all the local treatment facilities for handling problem drinkers. Both the National Council on Alcoholism and the American Medical Association publish directories listing resources for treating alcoholism in the various states.

Over 160 communities now have outpatient alcoholism clinics and counseling services, many of them state or county supported. The typical outpatient clinic offers the multidisciplinary approach to alcoholism, and has a staff of psychiatrists, internists, clinical psychologists, public health nurses, and social workers. Thus a patient may receive a combination of medical, psychiatric, and social care. In addition, there are a number of private clinics for those to whom cost is no consideration. Many companies operate or jointly underwrite treatment centers and rehabilitation programs.

Great progress has been made in developing ways of helping the alcoholic to become a useful member of society. It now remains to put these into action, to help the 5 million alcoholics in our country.

Addicting Depressants and Stimulants

The age-old problem of drug addiction has been explored extensively, with almost no progress toward a solution. Recently, renewed interest at local, state, and national levels has emphasized that the problem is complex and that the current methods of control are inadequate. The multidisciplinary approach, with fresh ideas, may yield help for the drug addict. If a breakthrough occurs, genuine, realistic support is needed from all professional people. The nurse who understands the problem can help to give necessary support.

The nurse should also understand the seriousness of addiction. Nurses have access to the narcotics for patients. Despite the specific terms of the Harrison Narcotics Law, a higher percentage of drug addicts has been noted among medical personnel than in the general population, and it is often the case that a doctor or nurse may be tempted to seek relief from pain with a convenient dose of morphine, Demerol, or Dilaudid.

DRUG ADDICTION—A NATIONAL PROBLEM

Drug addiction reached a low level during World War II, when practically all smuggling of drugs ceased. Since then, addiction has increased, and some people show little concern. Those with a casual, almost sanctioning attitude disregard the serious problems created by addiction.

Seldom can the drug addict keep a job, and to support himself and his habit, he engages in crime. Men steal; women are prostitutes. In New York City, 15 per cent of all burglaries are credited to drug addicts.

Since World War II, drug addiction among persons under twenty-one years of age has increased. Addiction may begin with an initial dose supplied as a friendly gesture; it may be taken to gain admittance to a social group; or a young person may be accepting a dare. This "social" introduction to drugs is more usual than that provided by a "pusher." But regardless of his reason for beginning, the young person soon lives with crime.

Drug addiction is more difficult to regulate because of the popularity of the amphetamines and barbiturates, two drugs which are found in every pharmacy and many home medicine cabinets. Amphetamines, barbiturates, Doriden, and marijuana are the drugs most likely to produce violence. Seldom is crime committed by a person under the influence of the opiates, including heroin. The opiates reduce anxiety, tending to leave the person submissive.

Officially, the United States has 60,000 drug addicts. One half of them live in New York City; half are Negro, and 20 per cent are women.

DEFINING DRUG ADDICTION

The U.S. Federal Code defines the drug addict as, "Any person who habitually uses any of the habit forming narcotic drugs so as to endanger public morale, and safety, or welfare; or has lost power of self-control with reference to his addiction." Narcotic addiction is a complex human problem occurring with continued use of sedative drugs (probably barbiturates or opiates), with three separate but related phases. These three phases are (1) tolerance, (2) habituation, and (3) physical dependence. *Tolerance* is the diminishing effect of the same dose of a drug, or the need to increase the size of the dose in order to get the same effect. *Habituation* is the psychological dependence on a drug after a period of use. *Dependence* is the body's physical need for the drug.

DRUGS USED

Table 7–1 contains a list of the addicting drugs and habituating drugs, with pertinent information. Note the number of drugs which have important medical uses.

Three fourths of all drug addicts use heroin. The majority begin by smoking marijuana, then graduate to heroin.

THE HALLUCINOGENIC DRUGS

The hallucinogenic drugs, including LSD (lysergic acid diethylamide), cause hallucinations, distort judgment, and have unpredictable effects on different people. LSD has caused users to become temporarily insane or suicidal. Control of the hallu-

Table 7–1. *Addicting and Habituating Drugs*

DRUG TYPE	USUAL METHOD OF INGESTION	PHYSIOLOGICAL PROPERTIES
Addicting drugs: cause emotional dependence, physical dependence, and withdrawal illness; create tolerance or need for larger doses		
Opium and its products: morphine, heroin, codeine, Dilaudid, Metapon, Pantapon, paregoric, laudanum	Now rarely smoked in U.S.; some products by mouth, usually by sniffing or injection into muscle or vein	Deaden pain, produce sleep (heroin, most important addicting drug, has no medical usage but produces sense of well-being and relief from worry; outlawed)
Synthetic substitutes for morphine: Demerol, Methadone, Dolophine	Same as above	Deaden pain
Barbiturates: luminal, phenobarbital, amytal, Nembutal, Seconal, barbital, pentothal, pentobarbital	By mouth or by injection; in addiction often combined with other addicting drug or as substitute for it	Produce drowsiness, sleep, relaxation, intoxication, unconsciousness
Habituating drugs: produce emotional dependence, but not tolerance or physical dependence		
Bromides: Nervine, neurosine, sodium bromide, and other bromides	By mouth	Heart and brain depressants; used in many patent medicines, can cause severe mental symptoms

DRUG TYPE	USUAL METHOD OF INGESTION	PHYSIOLOGICAL PROPERTIES
Marijuana, Indian hemp, "reefers," "muggies"	Smoked in cigarettes	No medical usage; effects vary—produces irresponsible and unpredictable behavior (second most important addicting drug; outlawed)
Cocaine	Usually by sniffing; occasionally by injection; in addiction often used with other addicting drugs	Has some medical value as local anesthetic; stimulates to excitement and hyperactivity, accompanied by delusions
Benzedrine-type drugs: Benzedrine, amphetamine, Benzedrex, Dexedrine, Tuamine, Desyphed, Mescaline	By mouth or inhalation	Relieve swelling caused by colds, retard sleep, produce excitement

cinogenic drugs is complicated because they may be produced in or out of laboratories with commonly available chemicals.[6]

A DISEASE OF COMFORT

Drug addiction is classified as a disease, but the addict hardly regards it so. With other diseases, the pain and discomfort of the patient provide real motivation for him to seek help; he wants to get well. The drug addict knows that successful treatment will mean the loss of his great source of comfort, the drug.

While under the influence of the drug, the addict has a temporary sense of well-being, termed *euphoria*. He feels at peace with the world. Tension, stress, fear, and pain are relieved; his problems disappear. This is what the addict lives for; nothing else is important. Not only is he emotionally dependent upon the drug, but he is physically dependent upon it; without it, withdrawal agony may come.

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[6] *American Journal of Nursing* (May, 1966), p. 116.

Physical Dependence and Withdrawal

Physical dependence appears to be related to changes in the nervous system and the endocrine glands. Changes may include cessation of menses in women and impotence in men.

Few drug addicts can afford to buy a sufficient quantity of drugs to develop a severe habit. Withdrawal symptoms may be so mild as to be mistaken for upper respiratory infection; the addict may experience extreme nervousness, "runny nose, goose flesh," diarrhea, and mild stomach cramps. However, when the strongly addicted person has the drug stopped abruptly, withdrawal symptoms can be quite severe. The most severe symptoms occur after thirty-six hours without drugs and include muscle tremors; painful cramps in the legs, back, and abdomen; difficulty in breathing; vomiting; diarrhea; increased pulse rate and blood pressure; high temperature; and rapid loss of weight. With barbiturate addicts, sudden withdrawal can be fatal.

Contrary to popular opinion, after the drug is effectively withdrawn the addict has no real physical need for the drug. The battle is with the mind, and he returns to the drug because his emotional needs must be satisfied.

Recognizing the Addict

The drug addict has a close-to-normal behavior pattern as long as he gets a sufficient dosage and may therefore be difficult to recognize. Some addicts claim to be more efficient and "normal" under the influence of drugs. Investigators cannot disprove this theory, but suggest it is more likely to be a rationalization, or fear of withdrawal. If the addict is not receiving sufficient dosage, he may appear acutely ill, with a pale, moist, clammy skin and trembling hands, and the pupils of his eyes may be dilated. The addict is usually thin. He is often poorly dressed, dirty, and unemployed.

Evidence of addiction is demonstrated by needle marks, or black and blue marks on the upper and lower arms and thighs. The addict who takes drugs intravenously will have characteristic vein markings.

Characteristics of Addicts

People who become drug addicts have often failed to find success or security. They are likely to be emotionally weak, unstable, irresponsible, immature, thrill-seeking, and full of demands but empty of offerings. One judge who has dealt with many addicts says that the addict has been morally and socially ill from childhood. Had he never been exposed to narcotics, he would have become a definite behavior and law-enforcement problem.[7] Studies of narcotic addicts show that frequently the addict has been recently or previously arrested for some criminal activity. He was a criminal first and a narcotic addict second.[8]

Occasionally a normal, well-adjusted person becomes addicted by the use of narcotics during a long illness or painful injuries. Doctors are aware of this possibility, and addiction is unlikely when the amount of narcotics given is decreased as the pain lessens. Some people may become addicted accidentally, falsely believing that, "This is the thing to do." Accidental addicts may be cured, because they have no special problem that makes them desire drugs, but few real addicts have been cured in the past. It requires a strong individual to overcome addiction, and the drug addict, often not a strong person originally, is unlikely to want, or be able, to conquer addiction.

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[7] Robert Gardner, "Finding the Real Answer," *Journal of Living*, Vol. 14, No. 1 (January 1962).

[8] Edward R. Bloomquist, *RX Health* (June 1962).

COMPLICATIONS OF ADDICTION

The physical deterioration of the drug addict is due less to the direct effect of the drugs upon the body than it is to malnutrition, general neglect of health, and recurrent infection.

The drug addict is uninterested in food. Money for drugs is more essential than money for food. He has neither the equipment nor the knowledge of sterile techniques for his "shot" of heroin. Infection may result from an unsterile needle or from impurities used to dilute the drug. Serious diseases such as malaria, syphilis, and infectious hepatitis have been transmitted from one addict to another by contaminated equipment. The drug addict may become emaciated, covered with abscesses, and susceptible to disease.

NURSE-DOCTOR ADDICTS

Narcotics addiction among members of the health professions, particularly among nurses and doctors, is a more serious problem than is generally recognized. The following appeared in a profesisonal publication:

> About 90 percent of nurse and physician addicts become addicted to Demerol. . . . [One] cannot say that the addicted professional has a psychopathic personality. . . . [He] often starts in an attempt to relieve distressing symptoms of aches or pain. The high incidence rate may be attributed only partly to the availability of narcotic drugs. . . . The major reason appears to be a widespread, erroneous belief that the drug has only mild addicting properties. . . . Demerol produces a greater elation than morphine, acts quickly, and addiction to it is rarely amenable to treatment. . . .
>
> Serious consideration should be given to the removal of Demerol from the market. Demerol is not a life-saving drug; adequate substitute is found in morphine. It is reasonable to estimate that removal of Demerol from the market would lower the rate of new addicts among doctors and nurses by two-thirds. This would be equivalent of adding

eight new nursing schools and two new medical schools to the number already existing.[9]

MOTIVATION FOR CURE

Occasionally a drug addict voluntarily enters the hospital for withdrawal because his body has built up such a high tolerance to the drug that he has difficulty getting sufficient dosage to prevent withdrawal symptoms. After two weeks away from the drug he can renew his habit, with less of the drug needed.

Some addicts have no interest in withdrawal. Others may be forced or pressured by the circumstances. Even with mixed motives, many people could be helped.

FEDERAL HOSPITALS

The federal government operates two U.S. Public Health Service Hospitals for drug addicts, one at Lexington, Kentucky, and the other at Fort Worth, Texas. These are for treatment of persons addicted to drugs controlled by the federal narcotics laws—opium and derivatives, marijuana, and cocaine. Addiction to the hazardous drugs barbiturates and amphetamines does not qualify an addict for admission. Success in curing addiction has been limited at such hospitals.

MULTIDISCIPLINARY APPROACH

Like every person with a major illness, the drug addict needs help from all resources in the community. The best approach is to combine all the community resources—voluntary, private, and public—to create the proper attitude, to help the individual realize he can get what he needs.

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[9] Solomon Garb, "Narcotic Addiction in Nurses and Doctors," *Nursing Outlook* (November 1965), pp. 30–34.

The drug addict needs medical help during the withdrawal period, and help to overcome the physical illnesses he may have developed. Psychotherapy would enable him to face the world and his problems realistically, and he might be helped to solve the problems that caused him to turn to drugs. Follow-up treatment would include social work intervention in the family situation, vocational counseling and placement, religious guidance, and continued psychotherapy, if needed. A neighborhood-based facility could supply this after-care treatment. Rehabilitation would be directed toward enabling him to live productively without drugs, and to become socially integrated. Professional people now recognize that drug addiction is a medical, social, and psychological problem.

Control of Drugs Needed

Clinics have been established in some countries to supply the addict with his drugs. These have not been successful, and the number of addicts has increased. It has been said that the average addict introduces four nonusers to heroin. As an overall trend, addiction has decreased since the passage of laws regulating the legal use of narcotics.

Laws with stiffer penalties for those dealing in drugs might help to protect the addict, as would removing the immense profits from the drug traffic.

Under the 1965 drug-abuse law, the Food and Drug Administration was authorized to control sales of amphetamines, barbiturates, and other depressant and stimulant drugs.

Progress in helping addicts may result from legislation which allows federal judges to suspend criminal proceedings against addicts who agree to medical treatment and rehabilitation.

Tobacco

The decision to smoke or not to smoke is personal, but the nurse should acquaint herself with the known facts regarding the use of tobacco. She should be objective in her discussions with patients, with family members, and particularly with teen-agers.

SMOKING AND LUNG CANCER

The Surgeon General of the United States Public Health Service released a report in January, 1964, that created immense public interest. This report statistically associated smoking with lung cancer and other chronic respiratory and circulatory diseases (Figure 7–3). Controversy continues. The tobacco industry is big business in the United States, grossing $8 billion yearly. Of this, $3 billion yearly are paid in excise taxes to federal and state treasuries. It is estimated that over 70 million Americans are habitual smokers. Anything that is such an integral part of the nation's economy and that affects so many people will be controversial.

The Surgeon General's report stated that heavy cigarette smokers showed a significantly higher death rate from lung cancer than did nonsmokers. Male cigarette smokers showed a higher death rate from coronary artery disease than did nonsmoking males. It also associated heavy cigarette smoking with cancer of the larynx, emphysema, peptic ulcers, cancer of the esophagus, and urinary bladder trouble in men.

Heavy smokers were defined as those smoking one to two packs of cigarettes daily; moderate smokers, one half to one pack per day; and light smokers, less than one half pack a day. Pipe and cigar smokers usually do not inhale, hence are not included in the same category.

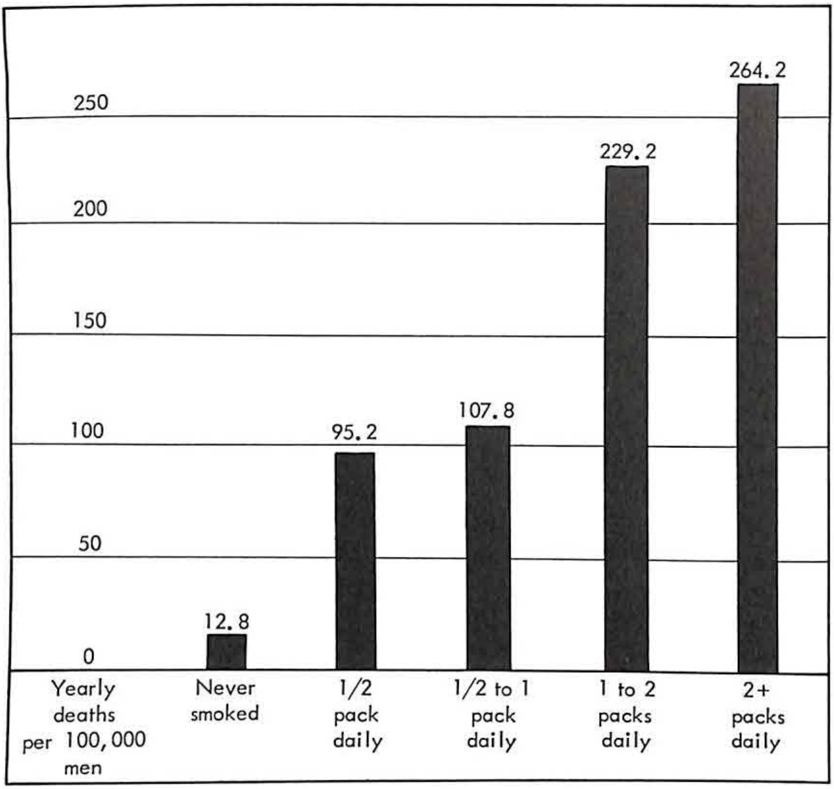

Figure 7–3. The more cigarettes, the more lung cancer. (From *Florida Health Notes,* October 1965. By permission of *Florida Health Notes.*)

Effects of Smoking

Primary effects of smoking come from toxic materials, nicotine and the isoprenoids. Nicotine is a poison that tends to stimulate nerve tissue. It first causes the blood pressure to rise and the pulse rate and heart beat to increase. Eventual slowing down of the pulse rate and heart beat is a toxic effect that brings fatigue. This explains why a person is stimulated temporarily by smoking, but the end result is fatigue.

Isoprenoids are the major organic cancer-producing chemicals which are products of the partial burning and distillation of tobacco.

It is possible that heavy smoking by an expectant mother may injure her baby, for it is known that nicotine can pass through the placenta of mothers who are heavy smokers into the circulation of their unborn children.

FACTS FOR YOUNG PEOPLE

Young people should learn the facts about smoking before they form the smoking habit. By placing emphasis on the adult privilege of deciding to smoke or not to smoke, the desire to show one is grown up by smoking may be counteracted.

In an intensive study of teen-age smoking,[10] most striking modification of smoking habits came from pointing out the bleak correlation between lung cancer and smoking, and early death and smoking; then challenging the students to make their own decisions.

It might also be pointed out that smoking is expensive. Smoking also tends to cause discoloration of the teeth and interferes with muscular power and growth itself. It lowers performance and increases fatigue. Nervous tension may be reduced in better ways than by smoking; actually, smoking will sometimes add to tension. The person who wants to smoke but cannot, is frustrated. Reactions vary greatly. With some people, their appetite is affected and nutrition suffers. With others, smoking helps to calm nerves and control weight.

QUESTIONS FOR DISCUSSION

1. Give the arguments for and against smoking, social drinking, and using "kick" drugs.

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[10] Virginia Barckley and Elizabeth C. Stobo, "The Adolescent Who Smokes," *Nursing Outlook* (February 1964), pp. 25–27.

2. What suggestions might help the person who truly wants to stop smoking?
3. What steps are being taken in your community to educate teen-agers about smoking, alcoholism, and the use of drugs?
4. Contact the division on alcoholism of your state health department (or state mental health department) to obtain literature on alcoholism. What help is available for the alcoholic? Does the state sponsor an outpatient clinic?

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Chapter 8

GOOD MENTAL HEALTH

Good mental health is sought by everyone. We all want happiness, peace of mind, and emotional well-being. A nurse particularly needs sound mental health if she is to be successful in a most demanding profession.

When focusing attention on the components of mental health, we recognize that, in actuality, mental and physical health cannot be separated. Physical health affects state of mind, emotions, and thinking. (From one third to one half of the patients in general hospitals have mental-illness complications.) Emotions and state of mind influence physical health. The mentally ill have many physical illnesses; they are prone to circulatory disorders, skin rashes, oily hair, and swollen feet. They may also have diarrhea, constipation, headaches, and menstrual pains. These are authentic physical ailments.

The focus today seems to be more on mental illness than on maintaining good mental health. To increase our understanding of mental health, let us concentrate on the characteristics of mentally healthy people and the signs that warn of approaching mental illness.

Definition

Mental health may be defined as a state of psychological and physical well-being in which a person is able to function effectively and productively, is able to get along with others and is reasonably well satisfied with his lot in life.

Just as good health is far more than the absence of illness, so is mental health far more than merely the absence of mental illness. There are varying degrees of mental health. Almost every individual has one or two odd habits or viewpoints that are overshadowed by many healthy characteristics.

LIKE YOURSELF

If you are a mentally healthy person you enjoy being with other people, but you are also comfortable alone; you have self-respect. It has been said that one must first love himself before one can love others. But this should be accompanied by an understanding of one's self. One must know what he can and cannot do. If a person is mentally healthy, he is able to recognize his shortcomings and weaknesses, as well as his assets. He can laugh at himself occasionally, and learn to take life's disappointments in stride, realizing that life has ups and downs. He can derive satisfaction from simple, everyday pleasures.

Mentally healthy people are usually self-confident. Evidences of a lack of self-confidence are unhappiness, "bossiness," and perfectionism. It helps to realize that a person cannot please everyone at any one time, nor can he please one person all the time.

GETTING ALONG WITH PEOPLE

If a person is mentally healthy, he trusts people and takes it for granted that others trust him. He has a sense of responsibility for his neighbors and fellow men as well as for himself. He is able to give love and consider the interests of other people, and to respect the differences between people. In relations with other people a mentally healthy person need not feel that he always must convince others.

MEETING THE DEMANDS OF LIFE

One definition of mental health includes, "to meet the stresses of life without abnormal emotional reactions." Tension, anxiety, and stress are part of living, for everyone meets disappointments, encounters problems, and faces difficult decisions. The natural course of life is for one's parents to die first. Few youthful ambitions completely materialize; everyone grows old. It is how an individual handles problems and disappointments that relates to health. Anxiety and stress utilize and waste energy. The mentally healthy person learns to recognize stress and to practice constructive action. Let us consider specific ways that might help you, the student nurse, to meet the demands of personal and professional life.

Talk out your problems with someone. Pick a good listener, not one eager to advise, but one who will listen patiently and allow you to release tension. Escape from the problem temporarily. See a movie or turn to another activity. You will have more energy when you come back to the problem. But do face the problem. Gather the pertinent facts, think them through carefully, and then decide upon a plan of action. Put the plan into effect and do not continually relive the decision.

If overwhelmed with several problems, it may help to take one thing at a time. Decide what is most pressing. Concentrate on it first. Set a short-term goal. Reaching it will give a sense of accomplishment when working toward the long-term goal.

Learn to accept what you cannot change.

Have regular physical examinations. Plan a healthy schedule of work, rest, and recreation. Learn to loaf. As a student nurse enrolled in a concentrated practical nursing program, you may have few hours for recreation. For a short time, with a definite goal ahead, one can make sacrifices, but to establish this as a permanent way of life may be disastrous. Specifically plan for new experiences, new hobbies, new friends.

When truly angry, work off your anger with physical activity. This can serve as a safety valve, but not as a genuine way of handling a problem.

Recognizing Signs of Approaching Illness

Mental illness rarely develops suddenly without precipitating factors. There are warning signals, and the nurse needs to be as sensitive to these symptoms as she is to early symptoms of other illnesses.

Indiana residents were shocked a few years ago when an elementary school principal walked into a classroom, shot and killed the teacher, walked into another classroom and shot a second teacher, fled the building, and took his own life. When those around him reviewed his life, they realized that this did not happen suddenly. The man had been giving warning signals, but no one realized the urgency. His personality had changed. Instead of being a friendly, outgoing man, he had become morose, cold, and indifferent to people. He had complained about the two teachers, saying they were persecuting him. He was overworked. Without any secretarial help, he was responsible for two grade schools, the school cafeteria, and the many pressing problems of school administration. He had applied at the placement bureau of his alma mater for employment elsewhere, but with a wife and two sons, and a home recently purchased, he could not easily change positions. His wife was in the process of getting professional help for him, but her efforts were not successful soon enough.

No one symptom indicates illness, but a combination of conditions will tell us that the person needs help. Watch for changes in behavior. Note peculiar behavior, especially if it is the opposite of how the person has always been; the optimist may become depressed, the neat dresser may become untidy, and careless in appearance. The person may complain about feeling bad, yet no physical reason may account for his illness. He may suffer loss of memory, be confused. Extreme depression may set in; the person may not be able to work and may be tearful and moody.

The symptoms are what we see. The psychiatrist knows how to seek and treat the underlying causes, not merely the symptoms alone, although he may need to allay the symptoms. For example, the alcoholic is usually trying to escape from a problem or a situation that he cannot handle. Aggressiveness may stem from the person's feelings of inadequacy, for which he overcompensates.

Learn to recognize the warning signals. Best results come from early treatment of mental illness.

The nurse is not expected to direct treatment of the mentally ill person. The psychiatric nurse works under supervision with orders from the doctor, but we all need to know the symptoms of mental illness, and especially those indicating suicidal tendencies.

Indications of Suicidal Tendencies

Each year more than 20,000 people die from suicide. Many more suicides are not reported because of family, name, wealth, inability to establish clear evidence, difference in a state's recording procedure, or for protection of survivors who might lose insurance benefits if the death were labeled suicide. Suicide statistics should be interpreted as minimal numbers.

People who plan suicide communicate their intentions many times to their spouses, physicians, and clergymen, in that order. Sadly, many people who commit suicide have had a recent appointment with a physician.

With proper education professional people and lay persons can learn to recognize clues indicating suicidal intent, whether these clues are given in direct or indirect form. The nurse should be particularly alert. Any combination of the following clues means that immediate help is needed.

Repeated talk of death or suicide threats may be indicated by such remarks as, "My family would be better off without me," or, "I can't stand it any longer; I want to die." Although many unhappy people make these statements and do nothing, it is dangerous to take such statements lightly. People who talk about suicide often do something about it.

Serious depression causes at least one third of all suicides. The person cannot sleep; or he may go to sleep without trouble, but awaken at three or four o'clock in the morning and be unable to go back to sleep. He has no appetite and loses weight. He loses interest, ambition, and ability to concentrate. He slows down, both mentally and physically. He feels hopeless, guilty, remorseful, and has a tendency to blame himself. Usually he feels that life is no longer worth living, and he has no sense of personal worth.

Serious illness, when the person is in constant pain or believes that he has an incurable condition, may prompt a desire to escape his suffering. Nurses are constantly alert to this possibility. The person may wish to spare his family prolonged suffering or great expense. He should be made to realize that their sorrow and guilt will be a greater burden to bear if he takes his own life.

Planning for death or absence are warning signals of possible suicide if the person has also been talking about suicide, exhibited general unhappiness, or been chronically ill. Making a will or discussing insurance provisions are essential details for all citizens, but when accompanied by behavioral changes, could indicate a more serious problem.

Alcoholics are another large group considered suicide-prone. They may die from alcoholism itself or may take foolish risks while under the influence of alcohol.

Extremism involving physical risk or actual danger during leisure-time activities may indicate an unconscious tendency toward self-destruction.

Depression is not always present. The "masked" or "smiling" depressive is frequently able to fool even the experts. No one is immune to depression. Those who develop depression are often ambitious, conscientious, respected members of the community. Their illness is not a sign of weakness, but the result of certain kinds of stresses on a particular kind of personality.

More women attempt suicide than men, but when men threaten or plan suicide, they mean it and often complete the act. The highest incidence of suicide is among men forty years of age and older. Negroes, proportionately, are low in suicide potential. San Francisco has the highest suicide rate of any city in the United States.

Personalities of those attempting or completing suicide often show a great deal of rigidity. Another significant trait is dependency, and over-identification with others; almost always the person lacks a feeling of personal worth. Usually the person who attempts suicide is trying to communicate his need for help.

Help in Emergency

Warning signs of suicidal intent present an urgent need for expert help. It is a dangerous mistake to delay asking for help, hoping the person will get better; professional assistance is needed. Any form of mental illness requires skilled help. The family members are too close and too personally involved to offer the kind of support needed.

In emergency situations the family physician is often the first source of help. If the person has no family physician, the local medical society or association may be called. Many large churches have, in addition to regular staff members, specially trained counselors or psychologists available for counseling. Social agencies in most communities have a referral agency that could be a source of help. Some agencies are established especially to deal with suicidal crises. For example, in Los Angeles there is the Suicide Prevention Center; in Boston there is Rescue, Incorporated; and in Miami there is an agency called Friends.

SEEKING PROFESSIONAL HELP

Help for the mentally ill is not always easily arranged. The nurse or the family may recognize symptoms, but the person may refuse to seek help, not wanting to admit the possibility that he is mentally ill. Help has to be sought in the right way, because if it is not handled correctly, it may only add to the problem. The person needing help can be encouraged to see his regular physician; he will undoubtedly feel bad, and this would be a normal course of action to follow. In many urgent situations, a spouse or other interested person must take severe, often legal action to accomplish the desired result of providing professional help.

THE PSYCHIATRIST AND PSYCHOLOGIST

The psychiatrist is a doctor of medicine with intensive training in all aspects of mental illness. He has had three or four years of premedical college training; four years of medical school, followed by one year of hospital internship; and then at least three years of residency training in psychiatry. His medical background enables him to diagnose and treat all types of illnesses affecting the nervous system.

The psychologist has studied the mind and its functioning, especially as it affects behavior. A practicing psychologist is usually a Ph.D., and has had formal and practical training in clinical psychology.

THE NURSE'S ROLE IN MENTAL HEALTH

The alert nurse incorporates the principles of sound mental health in her daily work. This means treating each patient as an individual and helping him toward good mental health. In obstetrics some patients will need reassurance, for some women may not want their babies. In pediatrics, ask, "Why does the child do this?" In nursing arts and procedures, tell the patient what you are going to do; offer reassurance. Remember, you communicate continually with the patient, both verbally and nonverbally. When you walk into the room, the way you enter communicates to him. The nurse must remain professional at all times. She must be continually alert to the symptoms of mental illness and know how to go about seeking professional help. Early recognition and early treatment are the most successful. A nurse should learn as much as possible about the community resources. For the benefit of the patient and his family, you should know names, locations, and methods of obtaining psychiatric services in the local hospitals; which ones have outpatient services; locations of the child guidance clinics and who is eligible for their services; and the location of state mental hospitals and institutions for the mentally retarded.

Table 8–1 gives the possible sources of help for the mentally ill. The psychiatric-social agencies will vary with the community. How does your community rate?

Table 8–1. ***Community Resource Referral Form: Mental Health***

	AVAILABLE	
	YES	NO
Psychiatric services, in-patient		
Private hospital	______	______
County (public) hospital	______	______
State mental hospital	______	______
Veterans' Administration hospital	______	______
Children's hospital	______	______
Psychiatric out-patient services		
County mental health clinic for adults	______	______
Guidance clinic for children	______	______
Psychiatric clinic at county hospital	______	______
Psychiatric clinic at state hospital	______	______
Psychiatric clinic at veterans' hospital	______	______
Psychiatrists in private practice	______	______
Halfway house for recuperating mentally ill	______	______
Social agencies offering counseling services	______	______
Emergency counseling service	______	______

Interpret to the Community

The nurse can help interpret the nature of mental health and mental illness to the community.

Some people still confuse mental retardation with mental illness. A general distinction is that the mentally ill person is emotionally ill. He has an emotional problem that he cannot solve. The mentally retarded have had brain damage which interferes with normal functioning.

Society tends to be sympathetic to the mentally retarded and suspicious of the mentally ill. Despite the progress made, many people still regard mental illness as a disgrace. The nurse can help people to understand that it is an illness and that the mentally ill are best considered in the same way as the physically ill. The mentally ill are sick.

The nurse can help the public to understand that the mentally ill person who gets better will still need support. He may recover sufficiently to leave the hospital, but if he returns to the same situation, he very likely cannot cope with it. The high rate of readmission to mental hospitals dramatically illustrates this point.

Multidisciplinary Approach

Bringing into play all the resources of a community, which is the multidisciplinary approach, is essential to improving mental health and relieving mental illness. The nurse can be the central controlling or motivating figure which makes the multidisciplinary approach successful. She can be with the person without explaining her presence. Thus she can serve as the catalyst that brings together the individual and the care he needs.

QUESTIONS FOR DISCUSSION

1. The local mental health association in your community may maintain a speaker's bureau and be able to send a qualified person to talk to the class on good mental health—a minister,

psychiatric nurse-supervisor, or hospital chaplain; contact them.

2. Explain further how emotions affect health.
3. Define *rationalization, projection, sublimation, identification,* and *compensation.*
4. Distinguish between neurosis and psychosis.
5. What is the process of referral for a person suspected of mental illness?

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Chapter 9

HEALTH MAINTENANCE AND YOUR PERSONAL PHYSICIAN

Whether on duty or in her own home, the competent nurse is alert for signs and symptoms that are indicative of health problems, and she strives to act calmly when an emergency arises. At the hospital she knows what to do. At home she will be able to function better if her family has arranged for the services of a private physician before illness strikes. They will make a better selection when the need is less urgent. These arrangements are best begun by an initial physical examination, which may disclose unknown conditions, make early treatment possible, limit severity, and prevent the need for emergency and heroic measures.

The Personal Physician

To know that the services of a good doctor are available if needed is reassuring in this day of increasingly impersonal urban life. Your personal physician can add information about your occupation, personal life, and financial status from the story you tell him. His own medical records will enable him to make a more accurate diagnosis when new symptoms appear. A competent personal physician will know when to call in a specialist.

You should know how your own doctor or his covering physician may be reached at all times, as well as what to do in an emergency. He will probably direct you to the emergency unit of the hospital he prefers.

Make a special effort to select a doctor when you move into a new community. Consider the advice of friends. If the doctor under consideration has given satisfactory care to respected people in the community, he has obvious merits. Ask the staff personnel or hospital superintendent to suggest a physician from their list of qualified doctors. Often the personnel department of a business will recommend a reliable physician to new employees coming into a new community. You may call the secretary of the county medical society. The office will have a list of physicians with their specialty qualifications, addresses, and other pertinent information.

The physician should have a personality that inspires your confidence. You will also want to know that he has good professional qualifications. He should be graduated from a recognized medical school, and should have training or experience in a first-class hospital. This would indicate that he has high-quality training. He should have staff membership with a good hospital. American Board certification is one readily available method to establish that a specialist has had excellent training. Most responsible physicians belong to their local, state, and national medical associations. He also belongs to specialty or general practice societies. He makes an effort to keep up with medical progress, to be informed of the latest research relating to medical or surgical practice. The doctor's office is some reflection of the quality of service. A well-equipped, clean, efficient office is usually associated with high-quality service.

After selecting a doctor, confirm your choice verbally with the doctor himself. You will want to know if he has the time and interest for additional patients. (An overworked physician may not be the best choice.) Ask about coverage in his absence; learn his office hours; find out if he will accept night calls and what to do in an emergency. Listen to what he has to say about his routine procedures and what he expects you to do. An initial discussion of fees for routine services establishes the proper background for discussing special-services fees which should be discussed before elective procedures are carried out.

Cooperate fully with your doctor if you wish to receive the best service. Do not withhold information. Be truthful and give him the full story. In return you may expect a more accurate diagnosis and treatment. If his diagnosis, conclusions, and instructions are not clear, request an immediate explanation. The patient may ask for consultation if he is not satisfied with diagnosis and treatment. A good doctor will realize that a patient with distressing doubts may be reassured by having another doctor's opinion and will usually arrange for the consultation even when it is only to satisfy his patient's insistence.

A consultation differs from a referral. The consultant gives advice only; he does not have authority in the case. The original doctor still has control of the case. With a referral, the personal physician has referred you to a specialist who has specific training required for the treatment of the particular condition. The new doctor prescribes medicine, administers treatment, and usually refers the patient back to the original physician.

If you cannot have confidence in the decisions of your personal physician, it is wise to find another doctor. Make the change politely but definitely by giving both doctors notice of, and the reasons for, your change. If the opinion of a second doctor is desired, the request for consultation should be made through your own physician. Do not change doctors simply because you are impatient. No doctor can cure some illnesses, and other illnesses require long treatment and the full cooperation of the patient. If you make an initial careful selection of your personal physician, a change will seldom be necessary.

Recognizing the Quack

If you are suspicious that the person claiming to be a doctor is not qualified, check his license with the state board of medical registration. If he is not a staff member of any hospital, there should be a reasonable explanation for this unusual status.

Several tactics can create a suspicion and alert you to check a license. The quack promises to cure the patient, even though the ailment has been labeled incurable. He may claim to have special medicines that are not available to the medical profession, or treatments that are secret may be used. Often the charlatan shows alleged authentic letters from patients claiming to have been cured. Sometimes the quack is accompanied by a "specialist" who administers treatments, a specialist reputedly trained in a foreign country. The quack will probably stay away from using narcotics, for he is not usually licensed to use them.

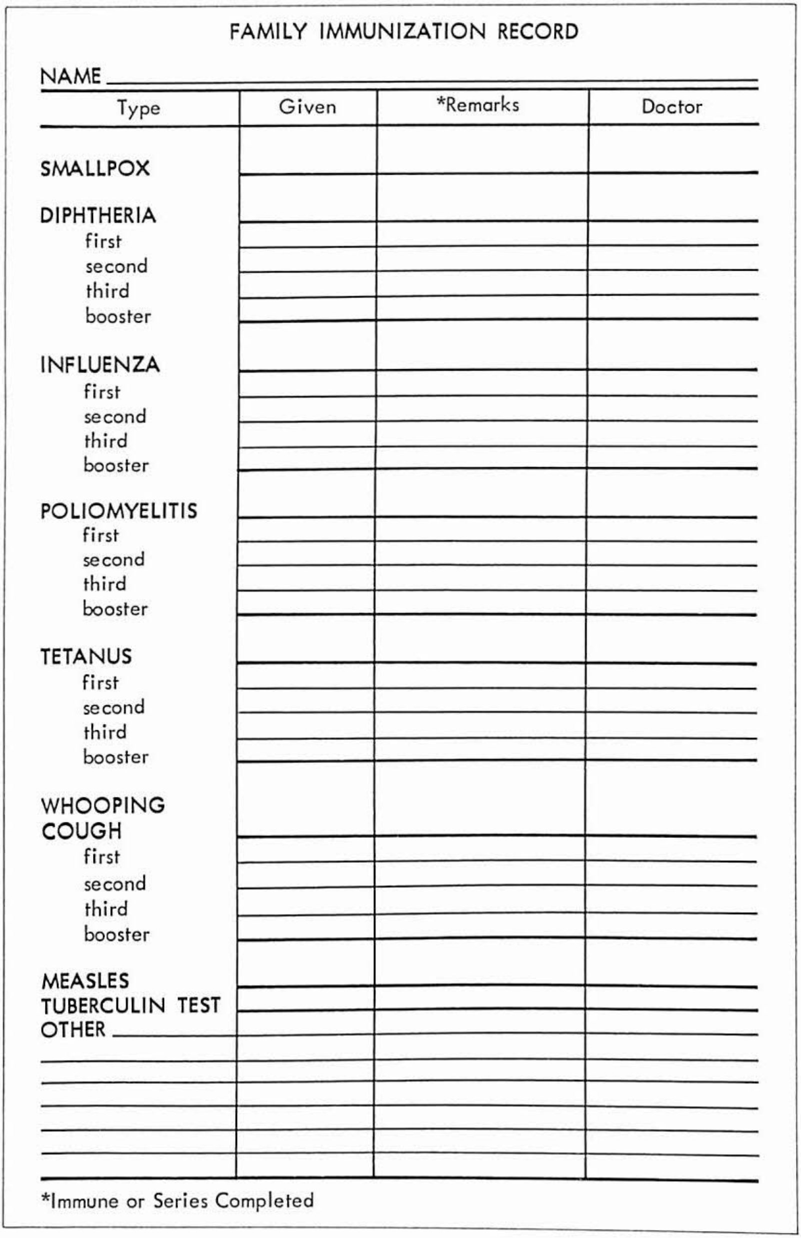
Later, in the discussion of the Food and Drug Administration, it will be pertinent to consider further why people listen to quacks, and what the nurse can do to stop this.

The Physical Examination

Proper health maintenance requires thorough physical examination. The physician is able to recognize changes and symptoms in the patient by comparing records of previous physical examinations. General health is improved because the person is able to correct unknown defects and poor habits and is thus better able to resist specific diseases. Periodic physical examinations aid in early diagnosis and treatment, thereby reducing the severity of the condition. Figure 9–1 gives a suitable form for keeping record of immunizations.

The frequency of physical examinations must be governed by practicality. An initial complete examination by a new doctor is ideal, because it establishes good rapport from the very start. He knows that you are his patient and he has the best possible technical background with which to evaluate any changes in your condition.

The expectant mother requires frequent visits to ensure proper prenatal care. The pediatrician determines the frequency of visits



FAMILY IMMUNIZATION RECORD

NAME ____________________

Type	Given	*Remarks	Doctor
SMALLPOX			
DIPHTHERIA			
first			
second			
third			
booster			
INFLUENZA			
first			
second			
third			
booster			
POLIOMYELITIS			
first			
second			
third			
booster			
TETANUS			
first			
second			
third			
booster			
WHOOPING COUGH			
first			
second			
third			
booster			
MEASLES			
TUBERCULIN TEST			
OTHER ______			

*Immune or Series Completed

Figure 9–1. A sample form for family immunization records.

for the baby and toddler. School children and young adults require examinations at certain times, such as when entering college or nurses' training. Premarital tests are required in most states. The different professions have individual minimum physical entrance requirements. Those most in need of yearly physical examinations are people who are forty or more years of age.

The practical nurse needs an appreciation of a complete examination, including past history and occupational history.

The physician measures the temperature, pulse, respiration, blood pressure, weight, height, vision, and hearing. He then examines the head, eyes, ears, nose, lymph nodes, chest, reproductive organs, rectum, pelvis, extremities, skin, and reflexes. The usual tests include a pap smear, urinalysis, chest x-ray, serology, and blood count. Other indicated tests are based on the findings of the history and physical examination.

Specialists and What They Do

With the explosion of scientific knowledge, one person cannot span a whole field. Possibly more than 50 per cent of our doctors today are listed as specialists. Generally, the personal physician refers you to the specialist.

The specialist differs from the general practitioner. The specialist has additional training in one particular field, over and beyond that of a general practitioner. He is considered an expert in his field. Often he cares only for a special class of diseases. The following divisions are to help the beginner learn the different specialists and are only general catagories:

The largest group of specialists are authorities on particular parts of the body, the "area men." Their names and specialties are:

cardiologist. Diagnosis and treatment of the diseases of the heart and blood vessels.

dermatologist. Treatment of the diseases of the skin and scalp.

endocrinologist. Diagnosis and treatment of the glands of internal secretion.

obstetrician. Management of pregnancy and childbirth.

ophthalmologist. Surgical and medical treatment of diseases of the eye.

otolaryngologist. Diagnosis and operative treatment of disorders of ear, nose, and throat.

otologist. Diagnosis and treatment of diseases of the ear.

EENT. Diagnosis and treatment of eye, ear, nose, and throat diseases.

orthopedist. Diagnosis and treatment of diseases and deformities of the bones, joints, and spine.

neurologist. Diagnosis and treatment of diseases of the nervous system.

gynecologist. Diagnosis and treatment of women's diseases, especially of the reproductive organs, urinary tract, and the rectum.

urologist. Diagnosis, therapy, and operative treatment of diseases of the urinary tract, including the reproductive organs in the male.

Physicians who specialize in techniques would include the *surgeons,* with their special areas of orthopedic, neurological, plastic, colon and rectal, and thoracic surgery. Other doctors who specialize somewhat in techniques are:

anesthesiologist. Administration of anesthetics and other drugs that produce loss of consciousness and sensation, operation of heart and lung machines, and the monitoring of the patient's reactions.

pathologist. Identification of disease through the analysis of body tissues, fluids, and other body specimens.

physiatrist. Treatment and restoration of the convalescent and physically handicapped patient.

psychiatrist. Interpretation and treatment of mental and emotional disorders. A subspeciality is child psychiatry.

radiologist. Diagnoses and treats diseases by the use of radiant energy, such as x-rays.

Wide-range specialists would include:

geriatrician. Management and treatment of the aged.
pediatrician. Management and treatment of children, from birth to the teens.
internist. Treatment of nonsurgical diseases and illnesses. Because of his special training in the diagnosis and treatment of internal organs of adults, the internist can adequately serve as a GP, or personal physician. Internists are expert diagnosticians.

A smaller group of specialists is composed of doctors concerned primarily with particular diseases or families of diseases. These include:

allergist. Treatment of a variety of afflictions that begin with an increased sensitivity to a normally harmless substance. These are afflictions such as hay fever, asthma, and eczema.
oncologist. A tumor specialist, or an expert on cancer.
phthisiologist. Treatment of tuberculosis of the lungs.
rheumatologists. Treatment of rheumatic diseases, such as rheumatism, arthritis, bursitis, and gout.

A number of specialists direct their attention to various aspects of the environment that influence health, in addition to studying the human body. These doctors are involved in such fields as aviation medicine, automotive medicine, tropical medicine, nuclear medicine, industrial medicine, and space medicine. Preventive medicine, school health, and public health are similar specialties.

Cooperating with the doctors are many qualified health workers and paramedical personnel who are essential to effective health maintenance and modern medical care. We have discussed the dentist, optometrist, optician, psychologist, and podiatrist.

The doctor of medicine is graduated from an accredited medical school. The *osteopath* has graduated from a school of osteopathy. The official definition of osteopathy as adapted by the American Osteopathy Association is, "That system of the healing arts which places the chief emphasis on the structural integrity of the body mechanisms, as being the most important single factor to maintain the well being of the organism in health and disease."[1]

QUESTIONS FOR DISCUSSION

1. Appoint one class member to call the secretary of the county medical society and to report back to the class the suggestions received regarding obtaining the services of a family doctor.
2. What are the purposes of the three to four years of college training prior to admission to a medical school?
3. Discuss the part played by medical licensing boards in maintaining standards of medical care.
4. What should be the place of health care in the family budget?

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PART II

Relationship Between Sanitation and Disease

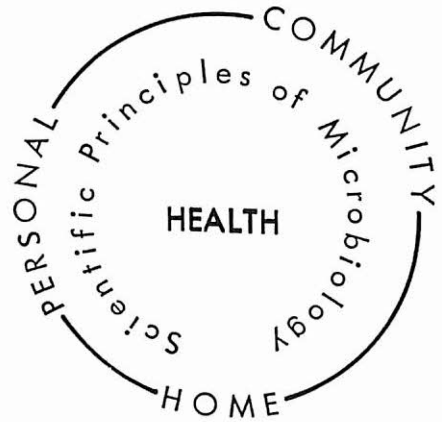

Figure 10–1. The scientific principles of microbiology relate to all phases of health.

Chapter 10

ORGANISMS PRODUCING COMMUNICABLE DISEASE

Why Study Microorganisms?

As the practical nurse's responsibilities for care of the sick increase, she has greater need to understand the cause of disease. The practical nurse does not always have immediately available the direct supervision of a registered professional nurse or a physician. She may work independently in many nursing situations. In the nursing of the less critically ill or in the nursing home, the practical nurse may be the floor supervisor or the only professionally trained nurse in contact with the patient. She should understand the nature of infectious diseases. This understanding requires knowledge of the organisms causing infectious diseases.

The control of microorganisms forms the basis for many essential nursing techniques and procedures. Aseptic procedures, sterilization, disinfection, and isolation techniques are all utilized to eliminate harmful microorganisms. The nurse who masters elementary microbiology will recognize the importance of routine, menial tasks. The bedside table is not washed merely for the sake of appearance; it is washed to help prevent the spread of infectious microorganisms. Bacteria control is the reason for many good health practices such as refrigerating foods and washing dishes. The nurse should be able to apply and adapt her knowledge. Memorizing rules or routines is not sufficient; she should know the reasons for the rules.

History of Treatment of Disease

The historic works of many outstanding scientists and physicians are related to the development of the germ theory of disease.

Man has always been interested in the reasons for illness. The early Greeks, Romans, and other ancient peoples attributed health or its absence to their mythical gods. Apollo was the Greek god credited with healing when he was soothed with music or with sending pestilence and death when he was angry. From Hygeia, the Goddess of Health, is derived the modern word *hygiene;* and from Panacea, the Greek Goddess of Medicine, comes the word *panacea* (cure-all).

The early Christians believed that God sent sickness as punishment for sins. Still later, another theory related illness to mysterious imbalances in the body.

Many practices originated in an attempt to ward off disease. Some medical folklore has been justified, indicating that a few observations were shrewd and perceptive. The American pioneers made tea from the leaves or flowers of the foxglove plant which grew in rural New England. Today the drug digitalis is refined from the same plant.

Most of the medical folklore is now known to be of little or no value, but some superstitions thrive today. As you increase your knowledge of good nursing care, you will become increasingly able to explain folklore and superstition.

Innumerable scientists and physicians contributed to the advances in medical science. The following men are considered outstanding.

Antony van Leeuwenhoek (1632–1723), a Dutch scientist, developed the first powerful microscope and discovered bacteria in various body fluids and water. He noted that the tiny "animalcules" were shaped differently, some spherical, some rod-shaped, and others spiral. Some of the "little animals" were in rapid motion. Van Leeuwenhoek's discoveries in 1675 to 1683 opened up a new world, that of the microscope. He is often called "The Father of Bacteriology." However, van Leeuwenhoek never related the living bits to health or sickness, and almost 200 years passed before people understood the importance of these microscopic creatures.

Edward Jenner (1749–1823), an English physician, observed that milkmaids who had recovered from cowpox did not contract smallpox. Because cowpox (contracted from cows) is a mild infection in humans, Jenner conceived a method of inducing the disease artificially. In 1796 Jenner vaccinated a small boy with cowpox; six weeks later he inoculated the boy with smallpox and the boy did not become sick. By 1800 thousands of persons had been vaccinated against smallpox and Dr. Benjamin Waterhouse had introduced the smallpox vaccination in America. Yet at that time, no one could explain how the vaccination protected against smallpox. They only knew that it was successful.

Louis Pasteur (1822–1895), the famous French scientist, was the first to prove the germ theory of disease and to destroy the concept of spontaneous generation. Pasteur demonstrated that microbes can come only from microbes. In 1867 Pasteur originated the process known as pasteurization. The French wine merchants had commissioned Pasteur to find a way to prevent their wines from turning sour. Pasteur showed that if wines were heated to 58°C. (136°F.) and held at that temperature for a short time, the "disease of wine" was prevented without altering the flavor. Pasteur later sought to prevent anthrax, a disease of cattle and sheep which is transmissible to man. He proved that anthrax is caused by a bacterium and prepared an effective vaccine for animals. The climax of Pasteur's career was his development of a vaccine and successful treatment for rabies in 1885.

Robert Koch (1843–1910), a German physician, in 1876 discovered and labeled the anthrax bacillus. During the years 1878 to 1881 he perfected the methods for isolating bacteria in pure cultures where each could be studied singly. In 1882 Koch discovered the tubercle bacillus that causes tuberculosis. That year he set forth his postulates, the method used to link positively a pathogen and an infectious disease. Koch's work stands a close second to that of Pasteur's in importance.

Baron Joseph Lister (1827–1912), an English surgeon, applied the discoveries of Pasteur even before the actual bacteria which cause surgical infections had been discovered. About 1875, Lister employed dressings treated with carbolic acid and introduced aseptic techniques to the operating room. The drastic reduction of infectious complications established the concept of antisepsis, the basis for present-day surgical techniques.

The work of Pasteur and Koch marked the beginning of the science of bacteriology. During the years following 1880, the organisms causing many important infectious diseases were discovered and isolated.

At the time of Florence Nightingale's magnificent work in the Crimean War (1854–1856), microbiology was in its infancy. Little was known about the transfer of infections from person to person. The discovery of the relationship of microorganisms to disease has resulted in far more complicated nursing procedures than those used by the "Angel of the Crimea." Lister's discovery of aseptic surgery led to the development of surgical nursing techniques. The development of preventive measures such as vaccines, toxoids, and immune sera has also produced great changes in nursing.

The progress of modern medicine furnishes a fascinating study, but it is beyond the scope of our limited discussion. We mention only one recent accomplishment.

Jonas Salk (1914–), American scientist, made available in 1954 the first truly effective vaccine against poliomyelitis. This marked the conclusion of a great cooperative effort in preventive medicine because Dr. Salk's vaccine was made through the virus-growing technique developed by Drs. Weller and Enders.

Albert Sabin (1906–), American virologist, subsequently developed another vaccine, an attenuated vaccine, which appears to provide an even greater immunity against poliomyelitis.

Thus we see that the knowledge of microorganisms causing disease has mainly been developed since the Civil War. It has been said that the average high school biology student knows more about the science of bacteriology than did the doctors one hundred years ago.

Scope of Study

In our study of microorganisms that cause infectious diseases, we shall first describe each type of microorganism, its special characteristics, and the diseases associated with it. The next step will be to study the responses of microorganisms and control methods.

Kinds of Microorganisms

All microorganisms are composed of organized masses of protoplasm called cells. Each living cell is capable of independent life, breathing, eating, eliminating wastes, and reproducing under specific conditions.

The protozoa are one-celled animals, microscopic but larger than bacteria. The protozoa have a well-defined nucleus and vacuole. Examples of the protozoa are the amoeba and the paramecium.

The word *fungi,* in clinical use, refers to all filamentous organisms having a tendency to branch out. Fungi are simple plants. Yeasts and molds are classified as fungus growths.

Bacteria are one-celled microscopic plants without chlorophyll. Because bacteria cause most infectious diseases, we shall study the group in detail.

The viruses are the smallest of the microorganisms, and the latest to be identified. The name filterable virus is sometimes used because the first viruses discovered were so small that they could pass through fine porcelain filters that other microorganisms could not traverse. Viruses require living cells for growth. They are normally found only inside other living cells and are the most important of intracellular parasites.

PROTOZOA

The protozoa are microscopic animals consisting of a single cell. They take in food, eliminate waste products, move about, protect themselves, and reproduce. Some species reproduce by indirect cell division, or mitosis; other species reproduce sexually with the union of two cells. Thus the one-celled animal is capable of the functions found in "higher" animals (see Figure 10–2).

The paramecium and amoeba are harmless protozoa which are normally found in fresh water. Because they may be seen with the aid of a simple microscope, the amoeba and paramecium are often studied by beginning biology students.

The protozoa are widely distributed in nature. They perform many useful activities, such as helping maintain the fertility of the soil and purifying sewage and waste.

Their harmful activities are of greater importance to the nurse. The diseases they cause are usually transmitted by insects. Malaria, the most widespread infectious disease, is caused by a protozoa, and is transmitted by the Anopheles mosquito. It is estimated that 2 million deaths result annually from malaria.[1]

Amoebic dysentery (amoebiasis) is an infection caused by an amoeba.

Several true tropical diseases are caused by pathogenic protozoa. African sleeping sickness is caused by protozoans and transmitted by the tsetse fly. Chagas' disease and Kala-azar (black fever) are protozoan-caused diseases transmitted by bloodsucking insects. Many of the tropical diseases are endemic in South America, Central America, and Africa.

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[1] Stewart M. Brooks, *Basic Facts of Medical Microbiology* (2d ed.; Philadelphia: Saunders, 1962), p. 214.

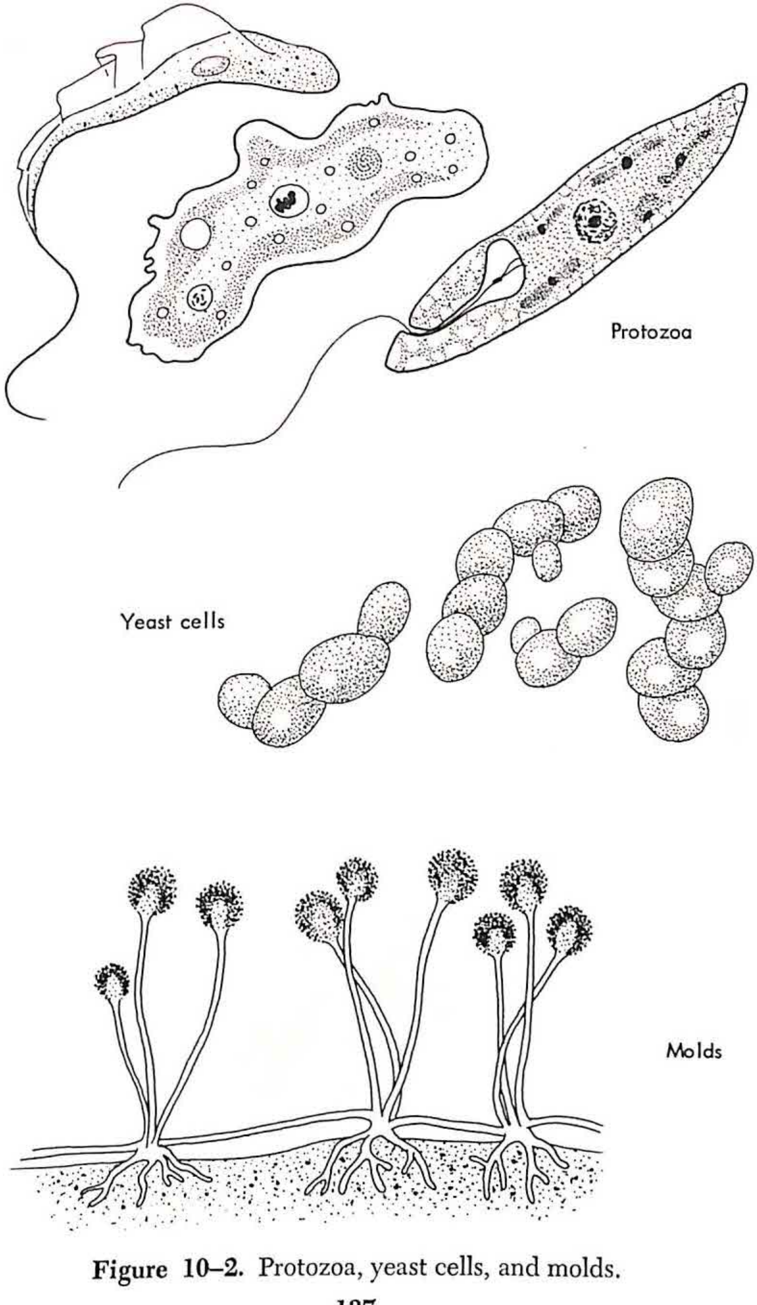

Figure 10–2. Protozoa, yeast cells, and molds.

FUNGI

Fungi include such plants as molds, yeasts, smuts, rusts, blights, and mildews. All these forms of life have economic importance, but nurses are mainly interested in the yeasts and molds. To the scientist, the terms yeast and mold are colloquial names for forms of life than cannot be accurately defined. However, these terms are commonly used for convenience, and so will be used here.

Molds and yeasts have similar characteristics. They are plants that lack chlorophyll, and grow independent of sunlight. They prefer the dark and grow on a lifeless medium. They are larger than bacteria, and their filaments and other structures can be seen without a microscope.

Molds are multicellular plants which grow rapidly under favorable conditions of air, food, warmth, moisture, and darkness. Remove one of these conditions and mold growth is stopped. For example, direct sunlight falling on an object will prevent mold growth. Mold growths lacking sufficient food remain stunted and are called mildew.

Molds typically form long, branched, hairlike filaments, or *hyphae*. These grow interwoven to form the plant body, the *mycelia*, which resembles thick cobwebs. Short rootlike branches are sent down into the food on which it grows. The filaments which extend beyond the surface form tiny knobs called sporangia, or the spore cases. Each sporangium contains thousands of microscopic spores which are released when dislodged. The wooly growth one sees is a characteristic trait of molds.

Beneficial molds include those used in cheese cultivation—different molds give the distinctive flavors of Roquefort, Limburger, or Camembert. Certain molds are the source of important drugs, such as penicillin and streptomycin.

Harmful molds cause ringworm, athlete's foot, and spoilage of foods. Fungus diseases are widespread and difficult to control. Once established, the fungus disease proves resistant to usual therapeutic measures. With extensive use of certain antibiotics, bacterial diseases seem to diminish and fungus diseases flourish.

Yeasts are unicellular organisms which reproduce by budding. Each cell produces a daughter cell, which eventually breaks off and reproduces in a similar manner. The relatively large spherical cells are clearly visible under a simple microscope.

Yeasts grow rapidly in a warm temperature and are killed by boiling.

Sugar in solution meets the food requirements for yeasts. They cause the sugar to ferment into alcohol and carbon dioxide. Yeasts are employed to make wine from grapes, cider from apple sugar, and beer from malt and hops. The released carbon dioxide causes dough to rise during breadmaking.

Most yeasts are saprophytes, that is, they depend upon non-living organic matter for food. One type of yeast is a parasite that invades the mucous membrane of the mouth and throat, causing a condition known as "thrush." Epidemics have occurred in nurseries of newborn babies.

BACTERIA

It may come as a surprise to learn that bacteria are not "bugs" but plants, single-celled, non-chlorophyll-containing plants which multiply by equal division, or fission.

The bacterial cell is a microscopic bit of protoplasm surrounded by a cell membrane and cell wall. In contrast to higher forms of plant life, most bacteria do not possess a well-defined nucleus. The nuclear material is usually dispersed throughout the cell in the form of nuclear bodies. The capsule is the gelatinous outer wall of a bacterium (see Figure 10–3). A species of bacteria may be identified by its capsule. It is generally believed that an organism's virulence (ability to produce disease) is related to the thickness and nature of its capsule.

Some species of bacteria form spores in response to adverse conditions. The spore represents an inactive stage of the bacteria. A protective coat develops which is resistant to ordinary chemical agents, heat, and lack of moisture. The bacteria can live as a spore for a long time, and when conditions become favorable

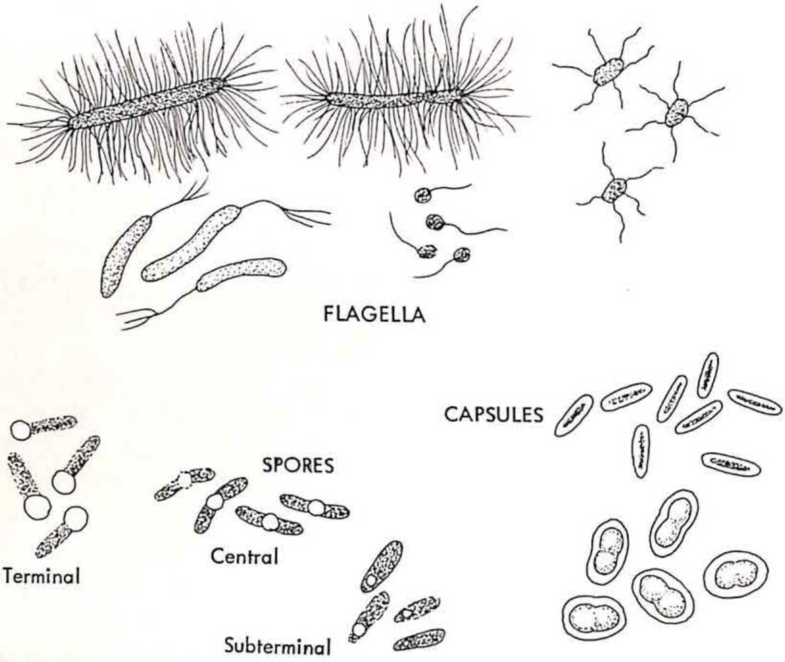

Figure 10–3. Bacteria forms.

germinate back into a vegetative cell. Thus spores represent a biological mechanism of survival not a means of reproduction. Because spore forms in bacteria are difficult to destroy, the nurse should note carefully which bacteria form spores.

Some bacteria are able to move about in liquids. These have hairlike projections, extensions of the bacterial cell, called flagella. By a whipping motion, the flagella can propel the bacterium through liquids. The speed of movement is influenced by temperature, food, type of liquid, and the age of the organism. Some bacteria lack flagella, yet can move about by a twisting, corkscrewlike motion. Many bacteria lack the power of independent motion. They wait to be pushed. Because motility aids the transmission of bacteria, this characteristic should be noted by the nurse.

Favorable Environment for Growth of Bacteria

Before describing the differences among bacteria, we should understand the conditions that contribute to their growth. All bacteria require food in one form or another in order to grow and reproduce. The food must be in useable or absorbable form. Moisture and other environmental requirements must be met. The environment must contain all elements that make up the bacterial cell. The major elements are carbon, nitrogen, phosphorous, sulfur, oxygen, and hydrogen. Other elements necessary are various salts, calcium, zinc, copper, potassium, magnesium, manganese, and iron.

All bacteria have a growth range, often a very narrow range, in regard to oxygen, temperature, light, and pH value. No growth will occur if any one of the required environmental factors is outside this range. Minimum food supply requirements must be met if growth is to occur. The food supply utilized varies greatly with different bacteria. Some require organic food, others inorganic food; all need vitamins. Simple, inorganic chemical compounds are the principal or sole source of food for the nonpathogenic bacteria present in soil and water; they do not need living tissue for food. Organic matter is required for food by other bacteria. Microbes that live on dead matter are called *saprophytes*. Those that live on the tissues of living organisms are called *parasites*. Pathogenic organisms live on organic matter.

The *moisture* requirement for living is related to the ability of the bacteria to form spores, and to remain infectious for long periods of time. Protoplasm needs water in order to survive and grow. Bacteria vary in their resistance to drying. The pathogen of gonorrhea lasts for only a few hours without water; the pathogen of tuberculosis may last for several months; spores of anthrax may last for years.

Oxygen requirements have been carefully studied. Microbes that grow in the presence of free oxygen are called *aerobes;* those that grow in the absence of free oxygen are called *anaerobes*. Some live best without oxygen, but can live in its presence. Others live best with oxygen, but can live without it. Some microorganisms are killed by free oxygen.

Temperature factors are frequently used to control bacteria because they are affected by temperature changes. They do not all "prefer" the same temperature. Optimum temperature is that temperature at which a species grows best. The minimum temperature is the lowest temperature and the maximum temperature is the highest temperature at which a species grows. Although most bacteria grow best at moderate temperatures, some will grow only at body temperatures.

Light, that is, direct sunlight, will either kill or inhibit the growth of microorganisms. Spores show a remarkable degree of resistance; hence light stimulates spore production.

Acidity or *alkalinity* affects bacteria and other microbes. The degree of alkalinity or acidity of a substance is measured by a mathematical expression called pH. The range is from 0 to 14, with pH of 7 as the neutral point. A pH above 7 indicates alkalinity; a pH below 7 indicates acidity. Blood is slightly alkaline, having a pH of 7.4 to 7.6. Most bacteria require a medium between pH 5.0 and pH 8.0 for optimum growth.

The effect of the environment on bacteria will be studied further when we consider how to control bacteria.

Kinds of Bacteria

Learning to understand the nature of bacteria and their control may be simplified by considering those with similar characteristics and shapes.

In general, bacteria are classified by shape into three groups: spheres, called *cocci* (singular *coccus*); rods or cylinders, called *bacilli* (singular *bacillus*), and spiral, curved or twisted rods, called *spirilla* (singular *spirillum*), *vibrios*, and *spirochetes* (see Figure 10–4).

None of the cocci form spores, and, with possibly a rare exception, none is motile. Some are aerobic, some anaerobic. Cocci arrange themselves in different ways as they multiply.

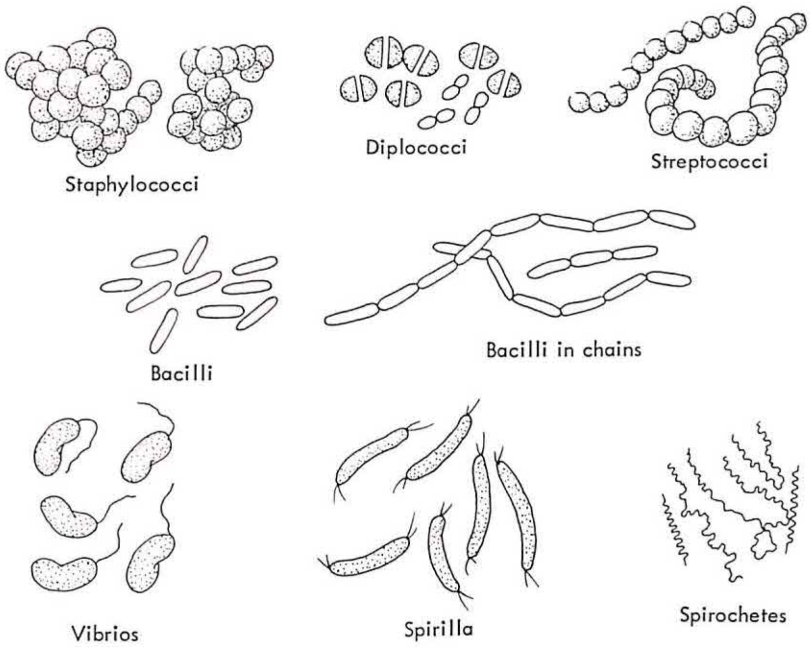

Figure 10–4. Types of bacteria.

The group of cocci that remain together in pairs after division are called *diplococci.* Diplococci include such organisms as the pneumococcus causing lobar pneumonia, the gonococcus causing gonorrhea, and the meningococcus causing epidemic meningitis. Another group of cocci cling together in long chains as they continue to divide, resembling a strand of beads. This type is called *streptococci* and include some of the most deadly pathogens. Most of the streptococci are easily killed by heat and antiseptics, but they may remain alive for some time when dried. Diseases caused by species of streptococci include erysipelas, mastoiditis, meningitis, pneumonia, puerperal sepsis ("childbed fever"), scarlet fever, septicemia ("blood poisoning"), septic sore throat, and sinusitis.

Cocci that usually arrange themselves in irregular or grapelike clusters are called *staphylococci.* The staphylococci are saprophytic and parasitic organisms, they do not form spores or possess flagella, and they grow under aerobic or anaerobic conditions. "Staph" are widely distributed in nature, and are commonly found on the skin and mucous membranes, especially those of the nose and nasopharynx. The principal pathogens are recognized by the characteristic color of the colonies. *Staphylococcus aureus*, the most virulent species, produces a golden pigment. One characteristic of a staphylococcus infection is the production of pus in the lesion. Staphylococcal infections include abscesses, bronchopneumonia, boils, pyelitis, carbuncles, cystitis, mastoiditis, osteomyelitis, pimples, and styes. The staphylococcal infections have increased in the last decade, both in severity and frequency. They present a major health problem in hospitals, where the majority of resistant strains are found.

Rod-shaped bacteria are called *bacilli*. Some microbiologists do not call all rod-shaped organisms bacilli, preferring the family, genera, or species name. The rod-shaped organisms include a large number of pathogens. The majority of one similar group inhabit or infect the intestinal tract, and are often referred to as the colon bacilli. These are generally motile and nonspore-forming, and cause fermentation of carbohydrates. Bacteria belonging to another genus, *Salmonella*, cause typhoid fever and paratyphoid fever. Four species of the genus *Shigella* cause bacillary dysentery, sometimes called shigellosis. The *Brucella* species, nonmotile and nonspore-forming, include pathogens causing bubonic plague (the "Black Death"), tularemia (rabbit fever), brucellosis (undulant fever), and pertussis (whooping cough). The organism causing diphtheria is another nonmotile, nonspore-forming bacillus.

The spore-forming bacilli are of particular concern to the nurse. All species of *Clostridium* are strict anaerobes, form heat-resistant spores, and are found in most fertile soils. These include the organisms causing gas gangrene, tetanus (lockjaw), and botulism, a food poisoning. The bacillus causing anthrax also forms a highly resistant spore, one which can live for years. However, the anthrax bacillus requires air and will not grow in its absence.

Rod-shaped bacteria that show irregular forms include the pathogens causing tuberculosis and leprosy. The tubercle bacillus is nonmotile and nonspore-forming, but more resistant to heat, disinfectants, and drying than several other disease-producing bacteria. In dried sputum or dust which stays in the dark, the tubercle bacillus can live for months.

The *vibrio* is a rigid microorganism, a short, slightly bent rod with a single curve and a single polar flagella. It is motile, nonspore-forming, and easily killed by boiling, pasteurization, and suitable disinfectants. The organism is present in sewage, polluted waters, and the excreta of patients and carriers. It causes Asiatic cholera, a severe infection always present in India and other Eastern countries.

The *spirillum* is a longer, rigid, curved organism, usually with several spirals, and it moves rapidly by flagella. The only species of medical importance is the one causing rat-bite fever.

The *spirochete* is a still longer, but flexible spiral organism. The spirilla are rigid, like wood, but the spirochetes can wriggle, twist, and bend like coiled steel springs. Syphilis is caused by a spirochete, a delicate, highly motile, and tightly coiled organism with pointed ends. The syphilis spirochete is probably the least resistant of all pathogens; even short exposure to drying or water will kill the anaerobic spiral.

The *rickettsiae* are microorganisms intermediate between true bacteria and viruses, and are often segregated into a separate group. The rickettsiae grow within the cells of the infected host; that is, they require living cells for growth as do virus. Rickettsiae resemble bacteria in that they may be observed under an ordinary compound microscope, being larger than the largest virus and smaller than the smallest bacteria. They are nonmotile, do not form spores, and are variously shaped—like tiny rods, diplococci, and single cocci. Rickettsiae are a serious medical problem throughout the world, causing such dangerous diseases as typhus fever, Rocky Mountain spotted fever, and scrub typhus. The rickettsiae characteristically inhabit the intestines of insects, both bloodsucking and nonbloodsucking, and insect bites spread the infections from human to human.

Comparative Sizes

Enough microorganisms have been described to attempt to ask, "How tiny is tiny?" Microorganisms are so minute that it would be cumbersome to use decimals to express fractions of an inch. Bacteria are measured in units called *microns*. One micron is equivalent to 0.001 millimeter, or 1/25,000 inch. The common cocci measures about 0.8 micron in diameter, or about 1/30,000 of an inch. Six or seven cocci could be packed inside a large bacillus, over 100 in a yeast cell. The tiniest bacillus measures only 0.15 micron by 0.3 micron. The largest measure 3.0 to 6.0 microns in width, and up to 80 microns in length. Most spirals are under 16 microns in length. The syphilis spirochete measure 0.3 in width and from 6 to 14 microns in length.

Viruses

Viruses are so small that they may be seen only with an electron microscope which has 80,000 times magnification (about 100 times stronger than the optical microscope). Because of their extremely small size, viruses escaped discovery until the 1890's. Progress in their control was further slowed by the fact that a virus can live only in another living cell. Successful laboratory work meant growing viruses in other living matter, and finding the exact living cells needed for each virus. When Drs. Weller and Enders succeeded in growing the polio viruses in bulk, using tissue culture, they opened the way for Dr. Jonas Salk to develop the vaccine against poliomyelitis. Dr. Salk fully credits them for making his work possible.

Virus-caused diseases are among the most deadly, and include some that have long been a scourge to mankind. Some measure of control was found for the dreaded diseases smallpox and rabies before the viruses, their causative agents, were identified.

Viruses exhibit a high degree of parasitism. For example, one virus enters a living cell. Twenty minutes later the host cell dies, and three hundred viruses, all equal to the first one, burst forth, ready to attack other healthy living cells. A parasitized cell becomes a "virus factory," which helps to explain the potency of the viruses.

The viruses are not a homogeneous group. New ones are constantly being discovered, and the known number is well over 200. The following description of the viruses will help you to see the scope and magnitude of current research work. Future progress in medical science undoubtedly lies with increased knowledge and better control of the viruses.

Descriptions of Viruses

The *Psittacosis* and *Lymphogranuloma venereum viruses* are comparatively large for viruses, yet they are only one-fourth to one-third the size of the staphylococcus. This related group of viruses cause a widely varying type of disease. The psittacosis virus, acquired from contact with birds, causes a pneumonia-like illness which is often called parrot fever. *Lymphogranuloma venereum* causes a common tropical venereal disease. Unlike most viruses, these are sensitive to certain drugs—the tetracyclines, such as Aureomycin, Terramycin, and Achromycin.

The *trachoma virus* causes a chronic eye infection which in severe form can produce blindness. This highly contagious disease is endemic in North Africa and the Middle East, and may be found in the southwestern United States in areas where unhygienic conditions prevail.

Pox viruses are composed of rectangular particles about one-third the size of a staphylococcus. They are transmitted from person to person and produce disease characterized by localized lesions or spots. Variola (smallpox), vaccinia (cowpox), varicella (chickenpox), and shingles are the most important viruses in this class.

The *myxoviruses* are small (one-tenth the size of staphylococci) and are capable of adhering to red blood cells and causing them to clump together or agglutinate. The influenza and mumps viruses are in this class, and can produce severe complications of meningitis and encephalitis.

Arbor viruses are tiny (one-twenty-fifth of staphylococci size). Their name is derived from the term *arthropod-borne,* meaning "insect-transmitted." Approximately seventy-five known arthropod-borne viruses [2] produce either infection or infectious disease in man. Among the more severe diseases are St. Louis encephalitis, Japanese B encephalitis, yellow fever, dengue, and sandfly fever.

Enteroviruses are tiny, one-thirtieth of staphylococci size. Because they inhabit the gastrointestinal tract, they are transmitted easily from person to person. Poliomyelitis is the best known of these viruses. In paralytic form, it is more serious than the Coxsackie viruses (twenty-four known) or the ECHO viruses (twenty or more).

The *adenoviruses,* a large number of coldlike viruses (about twenty-three separate members), are also small, about one-thirtieth of staphylococci size and inhabit human lymphoid, tonsillar, and adenoid tissues. They produce febrile respiratory infections, often in epidemic proportions.

Miscellaneous or unclassified viruses include those of infectious hepatitis, rabies, measles, and infectious mononucleosis.

Diagnosis of Infection

The physician is responsible for identifying an infectious disease, but as the nurse assists the physician in innumerable ways, she should know the general categories of information on which his diagnosis is based.

Signs and symptoms are the first consideration. In your nursing career, you will constantly observe the patient for symptoms. The characteristics of some illnesses are so easily recognized that the average persons knows them—most mothers can detect a case of measles with little difficulty. In all infections, the signs and symptoms contribute to the final diagnosis. A second basis for diagnosis is the immunologic tests performed on the patient. The patient's reaction affirms or disputes the presence of a suspected infection. The Schultz-Charlton reaction is an immunological test used to diagnose scarlet fever.

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[2] The Committee on Communicable Disease Control, *Control of Communicable Diseases in Man* (10th ed.; New York: American Public Health Association, 1965), p. 29.

The third important source of information for diagnosis is laboratory findings. Because the nurse is often asked to obtain specimens from the patient for laboratory tests, she should understand the purpose of these procedures.

LABORATORY FINDINGS

As a nurse, you may be asked to obtain from the patient an appropriate specimen of blood, urine, feces, sputum, pus from an abscess, or smear from the nose or throat. You will be taught the exact procedures to follow, for the specimen must be obtained and handled with great care if accurate results are to be yielded. A properly labeled specimen is sent to the laboratory for identification.

The work in the laboratory is conducted by a professional technician or a microbiologist. The nurse is not expected to become proficient in this area of medicine, but correct handling of specimens expedites the work of the medical bacteriologist. In the following paragraphs the most important methods employed to isolate and identify causative agents are presented.

Morphology and Staining Characteristics

In their natural state microorganisms are colorless and difficult to see under the microscope. When properly stained and magnified, the bacteria show their characteristic sizes and shapes (cocci, spirilla, or bacilli; chains or groups). The localization and appearance of the dye in the organism under study gives a further clue to its identity.

Culture and Growth Characteristics

If relatively few infecting organisms exist in the specimen, they often cannot be found or identified by staining methods alone. Growth on proper culture media may be the best way to isolate the organism. The trained observer notes how the organism grows on different media. The appearance of growing colonies gives definite clues as to the species. An organism from the growing colony may be stained, as mentioned previously, and thus identified.

Biochemical Tests

Even after finding the organism on the culture, the technician may obtain more information by using special chemical tests. For example, coagulation of plasma (coagulase) of a staphylococcus indicates that it is capable of producing significant disease. (It is also important to note if the bacteria cause chemical changes in certain substances, or if the bacteria ferment lactose, with or without producing gas.) The enzymes of certain bacteria will coagulate milk or liquefy gelatin. Hence if the unknown organism causes milk to coagulate, one clue to its identity is given.

Resistance Studies

Initial cultures or repeat cultures are done with known and varying amounts of antibiotics or other inhibiting matter added to the culture media. This measures the ability of the organisms to grow under adverse conditions and also gives the physician a measure of the results to be expected from initial or continued use of drugs or antibiotics.

Blood Serology

Certain diseases produce altered reaction of serum. Serology tests help identify the specific nature of current and past infections. For example, the S.T.S. (Serological Test for Syphilis) is one of the most frequently used routine blood tests.

Animal Inoculations

The bacteria under study are injected into a living animal to identify unknown organisms or determine whether identified organisms are capable of producing disease or death in the test animal. Animal reactions to many kinds of bacteria are similar to those of man. Different animals are used to evaluate a range of organisms. For example, the bacilli of rabbit fever (tularemia) grow slowly or not at all on the culture media in the test tube. But if a guinea pig is inoculated with the suspected material, the animal will develop tularemia and an autopsy will demonstrate the condition.

An understanding of the principles involved in laboratory findings will help the nurse provide assistance in diagnosis and treatment so greatly needed to render the best in patient care.

QUESTIONS FOR DISCUSSION

1. Select one great scientist to study further, or to read his biography.
2. Perform simple experiments as facilities permit. A single petri dish filled with agar-agar, left standing in open air, will demonstrate the presence of microorganisms.
3. Describe the method and rate of reproduction of bacterial cells.

4. Describe the chemical make-up of a virus particle.
5. List beneficial actions of protozoa, fungus, and bacteria.

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Chapter 11

COMMUNICABLE DISEASES OF PUBLIC HEALTH CONCERN

You have learned about the different kinds of microorganisms, conditions favorable to their growth, and names of the diseases that they cause. Now, how are the diseases spread? How can the spread of diseases be prevented? How does one guard against infectious diseases?

Remember, later in the nursing curriculum, you will study the symptoms, complications, treatments, and nursing care of patients with infectious diseases.

Scourges of the Past

After scientists accepted the germ theory of disease, they began to discover methods of controlling and combating the communicable diseases. Fewer epidemics of smallpox, cholera, leprosy, syphilis, and bubonic plague occurred. Before the days of the smallpox vaccination, ninety-five out of every one hundred contracted smallpox, and about one fourth of those died.[1] Many who recovered were blinded or disfigured.

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[1] Martin Frobisher, *Microbiology for Nurses* (11th ed.; Philadelphia: Saunders, 1964), p. 323.

The most lethal of infections was the bubonic plague, which appeared throughout Europe in the 14th century. The total mortality from the Black Death is thought to have been over 60 million.[2] The plague is primarily a disease of rodents. It is transmitted from an infected animal to a healthy animal by the rat flea, and the rat flea transmits the disease to man.

More Recent Epidemics

Rickettsial epidemics have on several occasions altered history. Some of these scourges have been second only to bubonic plague. Typhus fever, known also as camp fever or jail fever, is endemic (constantly present) in Russia and certain sections of Poland.[3] During World War I an epidemic of typhus fever killed 3 million people in Russia alone.[4] The body louse spreads the disease from human to human, which explains the high incidence of the disease during wars or under overcrowded, filthy conditions.

From 1918 to 1919 a terrible epidemic of influenza took the lives of half a million Americans, some 3 million people in Europe, and an estimated ten million throughout the world.[5] This has been called a *pandemic,* meaning a worldwide outbreak of disease. In the Netherlands in 1949, 2,200 people died from influenza and its complications.[6] The more recent pandemic of 1957 (the "Asian flu") spread from China to Hong Kong and was carried to all parts of the world. In the United States over one-fourth of the population became ill, with about 7,000 influenza-associated deaths.[7]

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[2] John J. Hanlon, *Principles of Public Health Administration* (St. Louis, Mo.: Mosby, 1960), p. 39.

[3] Stanley E. Wedberg, *Microbes and You* (New York: Macmillan, 1954), p. 386.

[4] Stewart M. Brooks, *Basic Facts of Medical Microbiology* (2d ed.; Philadelphia: Saunders, 1962), p. 150.

[5] Martin Frobisher, *Microbiology for Nurses* (Philadelphia: Saunders, 1964), p. 331.

[6] *Ibid.,* p. 332.

[7] Brooks, *op. cit.,* p. 178.

CURRENT STATUS

Reviewing past pandemics and epidemics serves to remind us that constant vigilance and application of knowledge is necessary to prevent recurrences. Cases of smallpox are so rare that many people forget the need for vaccination. Unknown contacts with the disease could be disastrous for many people.

Many communicable diseases remain a community health problem. Frequently people suffer from foodborne illnesses. Occurrences of venereal disease are increasing. Tuberculosis is still of significance, with new cases occurring every year. The practical nurse needs to understand how communicable diseases are spread and to learn methods of controlling them if she is to be an effective health worker in her community.

Mode of Transmission

Increased control of infectious diseases is due partly to more knowledge about the manner in which pathogenic microorganisms spread from one *source* to a new *host*. (From the list of definitions in the Appendix, read the meaning of the words source, reservoir, host, and carrier.) The two main sources of infection are man and animals. The human source of pathogens includes both patients and carriers. A patient harbors a pathogen during the period of the disease; a carrier, who may or may not have had the disease, harbors a pathogen for months or years. Chronic carriers can easily infect thousands.

The nurse must consider where the pathogenic microorganisms are located, that is, the reservoir. Now, how do they get to a new location to infect a new person? Some microorganisms are airborne; others are carried by water and food. Some are transferred by direct personal contact; others are spread by indirect contact. A large group of pathogens are conveyed by insects, spiders, and mites; and some bacteria normally present on or in the body may become activated and cause trouble.

AIRBORNE DISEASES

Airborne diseases spread widely within a short time. Transmission of microorganisms through the air is not easily interrputed. Despite the fact that many parasites die quickly after their discharge from a natural host, they are usually so numerous that enough survivors remain to infect fresh hosts. Microorganisms are spread through the air mainly by droplets of sputum, saliva, or other respiratory secretions, and by dust.

Infectious droplets are the nasal and oral secretions expelled from the nose and throat during sneezing, coughing, talking, and laughing. Larger droplets usually fall to the ground. Smaller droplets evaporate and leave suspended nuclei containing microorganisms which drift around for hours. The living microorganisms are protected by the residue of evaporated saliva or mucus. Some of the more important diseases transmitted by droplet infections include colds, smallpox, pneumonia, measles, diphtheria, scarlet fever, meningitis, and tuberculosis.

Infected dust is responsible for the spread of a few human diseases, and several animal and plant diseases. The psittacosis virus is excreted in the feces of parrots and other pet birds, then survives in the dust of the cage. Man catches the disease by inhaling the dust. Deep-seated fungal infections cause diseases of the lungs resembling tuberculosis. Cases are usually restricted to agricultural workers.

The viral diseases are airborne to a greater degree than are the bacterial diseases such as pneumonia, tuberculosis, meningitis, scarlet fever, and streptococcal sore throat. Some of the more important virus diseases likely to be airborne include colds, influenza, measles, German measles, smallpox, and mumps.

WATERBORNE AND FOODBORNE INFECTIONS

It has been said that of every five bacteria entering the body, four enter through the mouth, mainly by way of contaminated food, impure water, or unclean eating utensils. An estimated one-third of all contagious diseases can be transmitted by food.

Cases of infection spread by water or food often appear quite some distance, either in time or space, from the source of infection. Many of these organisms are relatively hardy. They may grow within a living host, but can adapt and multiply readily in nonliving media, such as food or water. Food is an excellent medium for microbial multiplication, more so than water, air, or soil. The proper processing, handling, and preparation of food will later be considered in detail.

Most pathogens transmitted by water or food cause diseases of the gastrointestinal tract. Scarlet fever, diphtheria, and tuberculosis may be food- or waterborne, but are also transmitted through the air by infectious droplets. Other diseases that may be spread by water or food include colds, influenza, infectious hepatitis, and undulant fever (brucellosis).

The following diseases are of particular public health concern. The kinds of "food poisoning" are described because these illnesses are ordinarily not studied along with infectious diseases, and must be understood by the practical nurse.

Typhoid fever is caused by the typhoid bacillus, *Salmonella typhi.* Until recent years epidemic typhoid fever was usually distributed by polluted water or contaminated milk. Greater attention to water purification and pasteurization of milk has eliminated most epidemics of this type. Today the concern is mainly when a disaster strikes a community, with an interruption of the normal supply of water, food, and milk. When sewage creeps into drinking water, the water source becomes contaminated. If the excreta of one typhoid fever patient contaminates the water supply, an outbreak of several hundred cases of typhoid can be expected within two weeks. Contamination is often by the hands of a carrier or missed case. The carrier state is most common among females infected during middle age. A classic case of a carrier is that of a cook, now known as Typhoid Mary, who spread typhoid fever wherever she worked.

Salmonellosis is a so-called food poisoning caused by a salmonella bacteria infecting the gastrointestinal tract. More than

100 strains of salmonella bacteria have been isolated, including the typhoid bacillus. Salmonella may infect animals as well as man. The pathogenic microorganisms are spread by the feces of infected persons or animals, or even eggs or dried egg powder. Outbreaks have been traced to improperly prepared food, especially meat pies and roast fowl; unpasteurized milk or dairy products; pastries contaminated with rodent feces; or food prepared by an infected food handler. The person becomes ill after eating contaminated, improperly cooked food. The salmonella organisms continue to multiply inside his body to cause the illness. To prevent salmonellosis, thoroughly cook all foodstuffs, particularly fowl, egg products, and meats; keep food under proper refrigeration at all times; protect food from insects and rodents; encourage good hygiene among food handlers, especially washing the hands after the toilet; and attempt to control infection among animals.

Shigellosis is a severe bacillary dysentery caused by any one of the species of shigella bacteria. Dysentery is a frequent and serious disease in underdeveloped countries of the world where malnutrition is common. Epidemics frequently occur in institutions, prisons, military barracks, and summer resort areas. Bacillary dysentery is spread in much the same manner as typhoid fever; that is, the bacilli enter the body through the mouth, and they leave the body in the feces of carriers or patients. They are often distributed in food contaminated by carriers or by fleas and other insects that have access to the discharges of patients. Good sanitation is the key to prevention, with emphasis on cleanliness in the kitchen, good personal hygiene for food handlers, and exclusion of infected persons or suspected carriers from food preparation. In all cases of infection, the nurse must make certain that the feces of the patient and all contaminated materials are disinfected. The disease can be transmitted as long as the organisms are present in the stool of an infected person.

Salmonellosis and shigellosis are commonly called food poisoning but a more correct name is "food infection." The illnesses are caused by pathogenic organisms multiplying inside the body. Botulism and staphylococcus food poisoning are in reality "food intoxications." Food intoxications result from the waste products or toxins given off by the bacteria as they grow and multiply. Food intoxications may also be due to chemical contaminants (heavy metals or fluorides) or to a variety of organic substances that may occur in natural foods such as certain mushrooms, mussels, eels, and other sea food.

Botulism is a rare but frequently fatal disease caused by eating contaminated and undercooked meats and vegetables (often home-canned) or poorly packaged fish products. *Clostridium botulinum*, the causative agent, is a spore-forming, anaerobic bacillus which grows in the soil and in the intestinal tract of animals. It grows best at room temperatures, in a nonacid medium. The lethal toxin given off by the bacilli may be present in the food before it is eaten or it may be produced inside the body after the food is eaten. The toxin in food is destroyed by boiling, but the killing of spores requires a higher temperature. Most cases of botulism today result from home-canned foods that have not been cooked long enough to destroy the toxin, bacilli, and spores.

Staphylococcus food intoxication is much more prevalent than botulism but is seldom fatal. When staphylococci grow in the body, they produce local infection. When staphylococci grow in food, they produce a toxin that is the cause of much of the acute food poisoning in the United States. In contrast to the toxin causing botulism, the toxin produced by staphylococci is not destroyed by cooking. Hence preventive measures are extremely important. Perishable foods are the most likely offenders: processed meats; ham, potato, and chicken salad; custard-filled pastry; and bread dressing. The staphylococci may be accidentally introduced into food by a food handler with a skin infection or any of several ways. Any person with a skin infection should not work in a kitchen. All food handlers should be educated regarding strict attention to sanitation and cleanliness in the kitchen. Such foods as sliced and chopped meats, custards, cream fillings, and leftovers should be promptly refrigerated.

Trichinosis is a severe infection caused by invasion of a tiny parasitic worm, *Trichinella spiralis*. It occurs in small epidemics in areas which receive infected pork. Trichinosis is relatively common in the United States and Canada. Its signs and symptoms are so variable that it is often not recognized. The trichina worm passes its first stage in the pig, dog, rat or cat as a cyst in the muscles. If man eats infested pork that is insufficiently cooked, the cysts develop into sexual worms in the intestines. The female worm produces larvae which penetrate the intestinal wall and enter the lymphatics. They are carried from there by the blood to various muscles and organs where they encyst. Once encysted in the muscles, treatment is only for the symptoms. No specific drug is effective. The control program must center on preventive measures such as exterminating rats, cooking garbage fed to pigs, and cooking thoroughly all pork and pork products. Low temperatures are believed to be effective in killing the trichinosis larvae. If pork is held at −16°F. for thirty-six hours, the larvae are killed. The home freezer cannot be relied upon to do this.

Direct Personal Contact

Organisms distributed by direct personal contact include those causing the venereal diseases, syphilis and gonorrhea, as well as staphylococcal and streptococcal infections. Because the last two may be present in the body of a healthy person and become activated, we shall consider the spread of these infections in our discussion of the activation of bacteria.

The incidence of syphilis and gonorrhea has been increasing since 1957. In the preceding decade, the frequency of venereal diseases had decreased because of the effectiveness of the antibiotics, in particular penicillin. Actually penicillin is not infallible. Its effectiveness is related to immediacy of treatment, and the chance of permanent cure diminishes with the length of time the infection exists in the body. In some cases the syphilis microorganisms have been found resistant to antibiotics. A new strain of penicillin-resistant gonococci is emerging. Probably the increase in venereal diseases is chiefly caused by social factors, such as changing moral standards and greater mobility of the population.

Syphilis, a highly infectious and dangerous disease, has been causing insanity, paralysis, blindness, deformity, and death all over the world since the crews of Columbus's ships brought the disease to Europe. Syphilis is caused by *Treponema pallidum,* a motile spirochete. The spirochete dies quickly outside the body because it is sensitive to drying, cooling, and disinfecting. Detergents quickly destroy it. The organism gains entrance to the body through the skin or mucous membranes. Most often it infects the genital organs during sexual contact and occasionally the lips during kissing. Within a short time after the first chancre appears, varying from a few hours to several days, the spirochetes enter the blood stream and are carried to every organ of the body.

Untreated syphilis passes through three stages, of which the second stage is the most highly infectious. The rash, ulcers, and sores swarm with spirochetes. The disease may be spread at this stage by the patient himself or by articles still moist with his secretions. Nurses, doctors, and laboratory workers must be exceedingly careful because a slight scratch in the skin might permit introduction of the spirochete. Unfortunately the person in the most infectious stage of venereal disease is usually not ill and continues at his work. However, only rarely is a case of syphilis acquired other than by direct contact with the infected person. The best protection against syphilis is to lead a normal moral life. Promiscuous persons are major carriers of the spirochete. It is of great concern that the new cases of syphilis primarily involve young people between the ages of fifteen to thirty. The U.S. Public Health Service estimates there are 60,000 new cases of syphilis yearly. Nearly half of the reported cases of syphilis in the years 1957 to 1961 occurred in the fifteen to twenty-four age group, among both whites and nonwhites and at all socioeconomic levels. Adequate community programs are needed, which will be discussed later.

Gonorrhea is ten times as common as syphilis. The U.S. Public Health Service estimates there are 1 million new cases of gonorrhea yearly. There is an even greater tendency than with syphilis for those infected to hide the disease and resort to self-treatment. The causative agent, a nonmotile, nonspore-forming diplococcus, is not found outside the human body unless it has been recently discharged. The gonococcus is extremely sensitive to drying and to minor temperature changes on either side of 37°C. (98.6°F.). Some evidence exists that infected bed linen, night clothes, and towels have been responsible for a few cases when the contact with the viable discharge was almost immediate. Adults contract the infection almost exclusively through sexual contact with infected individuals. If a woman with gonorrhea gives birth to a child, the baby's eyes may become infected during the birth process. Prompt treatment by placing a drop of silver nitrate or other prescribed antiseptic into each eye immediately after birth will save the baby's eyesight. Nearly all states have passed laws to require this treatment for all newborn babies. An adult patient with gonorrhea may infect his eyes by means of his hands. The infection is called gonorrheal ophthalmia. Doctors, nurses, and medical students have been known to contract gonorrheal ophthalmia through caring for patients.

INDIRECT CONTACT

Pathogenic microorganisms are frequently transmitted by indirect contact, that is, by contact with contaminated objects (other than food), which are called fomites. Fomites include clothing, bed linen, drinking cups, brushes, pencils, books, playthings, and so on. This mode of transmission can be controlled by the exercise of good personal hygiene and good common sense.

Influenza, a virus disease, may be spread indirectly through the use of common drinking glasses, towels, and other items. Trachoma, a disease of the eyes, is often transmitted by the use of a common towel. Diphtheria may be transmitted by indirect contact.

The *diphtheria* bacillus is particularly well adapted to living for a long time in saliva and mucus deposited on dishes, tableware, and toys. The diphtheria bacillus is easily killed by heat, because it forms no spores, but it withstands drying and exposure to light better than many nonspore-forming pathogens. If a diphtheria patient coughs violently, he may disperse bits of throat membrane which can dry on furniture. These bits of membrane contain bacilli which may remain alive for weeks and be distributed by dust. Frequently, among children a pencil or drinking cup may go directly from one mouth to another and thus transmit pathogens. Although called a childhood disease, diphtheria occurs among adults, including doctors and nurses who become careless. Diphtheria is a comparatively rare disease today because of immunization, but its seriousness and contagiousness merit careful attention when it does occur. Many cases of slight infection go unrecognized.

Vectorborne Diseases

A vector is an organism that transmits infection, usually an insect, but possibly a spider, mite, or tick. Vectorbone diseases include some caused by bacteria, many caused by viruses and rickettsiae, and a few caused by protozoa.

Vectorborne protozoan diseases include malaria, which is carried by mosquitoes, and African sleeping sickness, which is carried by the tsetse fly. Bacterial diseases carried by vectors include bubonic plague, spread by the rat flea, and tularemia, spread by ticks, lice, and deer flies. Viral diseases spread by mosquitoes include encephalitis, yellow fever, dengue, and other fevers. Ticks also spread viral encephalitis, Colorado tick fever, and other fevers. Rickettsial diseases include typhus fever, Rocky Mountain spotted fever, scrub typhus, and Q fever.

True vectorborne diseases are transmitted because the insects themselves are infected by organisms and transmit the pathogens to humans when they bite. Some insects, flies, and cockroaches pick up diseases organisms as they walk over filthy materials and then leave these organisms on food, dishes, or utensils. Sometimes this is called mechanical transfer of microorganisms by vectors.

Insectborne infections are often seasonal, related to the life cycle of the vector insect, and are also influenced by the weather, for example, a dry year or a damp year.

Malaria has practically disappeared in the United States and Canada, and cases are mainly those which military personnel have contracted outside the United States. Malarial protozoa develop in the anopheles mosquito as part of their life cycle and are deposited in the human bloodstream when the mosquito feeds. Here the protozoa reproduce asexually. If a second mosquito feeds on the patient after a few days, the sexual stage in the life cycle of the protozoa can be completed. Malaria is not a directly communicable disease. It can be spread from person to person only with the aid of the anopheles mosquito. Hence control of malaria requires the elimination of mosquito breeding places. Numerous tropical countries have greatly reduced the incidence of malaria by modern control methods, but it is still a major problem in many parts of the world.

Yellow fever is the viral disease that had to be conquered before the Panama Canal could be built. Urban yellow fever is transmitted from man to man by a domestic mosquito, the *Aedes aegypti.* The mosquito bites a sick person, becomes infected, and twelve days later is capable of transmitting the disease to another human with its bite. Jungle yellow fever is present in wild animals, particularly the monkey. Forest-living mosquitoes transmit the infection from monkey to man, as well as from monkey to monkey. Jungle yellow fever and urban yellow fever are clinically alike. Urban yellow fever has been almost eliminated in the Caribbean area, but it is still a major disease in Africa and South America. *Aedes aegypti* mosquitoes exist in Florida and other coastal states, hence constant vigilance is maintained to prevent occurrence of yellow fever.

Typhus fever is both epidemic and endemic. Epidemic or European typhus fever is spread from human to human by the body louse. The louse transmits the rickettsia by biting an infected person, becoming infected, and depositing his feces on another person. Because the louse defecates at the same time that it bites, the human becomes infected by scratching the infectious material into the skin. European typhus has been known to destroy armies and in this way was probably responsible for the downfall of Napoleon. Endemic or murine typhus is world-wide in distribution and occurs with considerable frequency in southern United States and Mexico. Endemic typhus is transmitted from rats to man by the bite or the feces of rat fleas. Although sometimes milder than epidemic typhus, endemic typhus is essentially the same disease.

A similar disease occuring in the United States is known as Rocky Mountain spotted fever. It is transmitted to man by the wood tick in the western United States, by the American dog tick in the eastern United States and the Mississippi Valley, and by the lone star tick in the coastal states from North Carolina to Texas. The tick can pass the rickettsia from parents to offspring through the egg, serving both as reservoir and vector of the infection. Rickettsial fevers can be controlled by eliminating the vectors and raising living standards. Various agencies of the United Nations are working towards elevating living standards in underdeveloped areas where typhus fever remains a major health problem.

ACTIVATION OF BACTERIA

Many bacteria are normally present on the body surface or in the body cavities and do no harm until they are activated. The colon bacteria which normally reside in the intestines are of no pathogenic significance there. However, when the organisms invade other tissues, infections can and do occur, infections such as peritonitis, cholecystitis, abscesses, and pyelitis.

The staphylococci are usually present on the skin and mucous membranes, especially those of the nose and nasopharynx. Many healthy persons harbor pathogenic strains in their nostrils or mouth, or on their skin. These individuals either possess some immunity against their own staphylococci or have highly resistant skin and mucous membranes. The "staph" may invade the tissues with a break in the skin or mucous membranes or with lowering of natural resistance. Rubbing may force the organisms through the unbroken skin. Sometimes they enter via hair follicles or sweat ducts, and start infections. As with most infections, the general resistance of the body determines the outcome.

Of course, pathogenic staphylococci may be transmitted directly from one person to another. Figure 11–1 demonstrates the importance of the hands in transmission. Staphylococci strains have emerged that are penicillin resistant, becoming at times so common on the skin and mucous membranes of physicians, nurses, and other attendants that hospital infections have risen alarmingly.

Immunity to Infection

Not everyone exposed to pathogenic microorganisms contracts disease. Many people have resistance to a disease; this resistance is called immunity. Immunity may be inherent or it may be acquired. *Natural, inherent immunity* is present at birth or shortly thereafter, and persists throughout life. It may occur at the species, racial, or individual level. Most diseases which infect man do not attack animals, and most animal diseases do not infect man. Horses do not normally contract measles or mumps; man does not become infected by the distemper virus of the dog. None of the lower animals contracts either syphilis or gonorrhea in nature. These are differences among species.

Differences in resistance to disease have been noted among races. The Negro appears to be highly susceptible to tuberculosis and more resistant to malaria and yellow fever than persons of other races. American Indians have a disproportionately high rate of tuberculosis whereas the Jewish people have a comparatively low rate.

Individual immunity refers to differences in resistance among members of the same race. One person may suffer a mild infection of a disease which proves fatal to another person. An individual's own immunity may vary from time to time. Factors influencing general body resistance to disease include age, sex, nutrition, fatigue, and climate.

Acquired immunity is developed during the lifetime of a

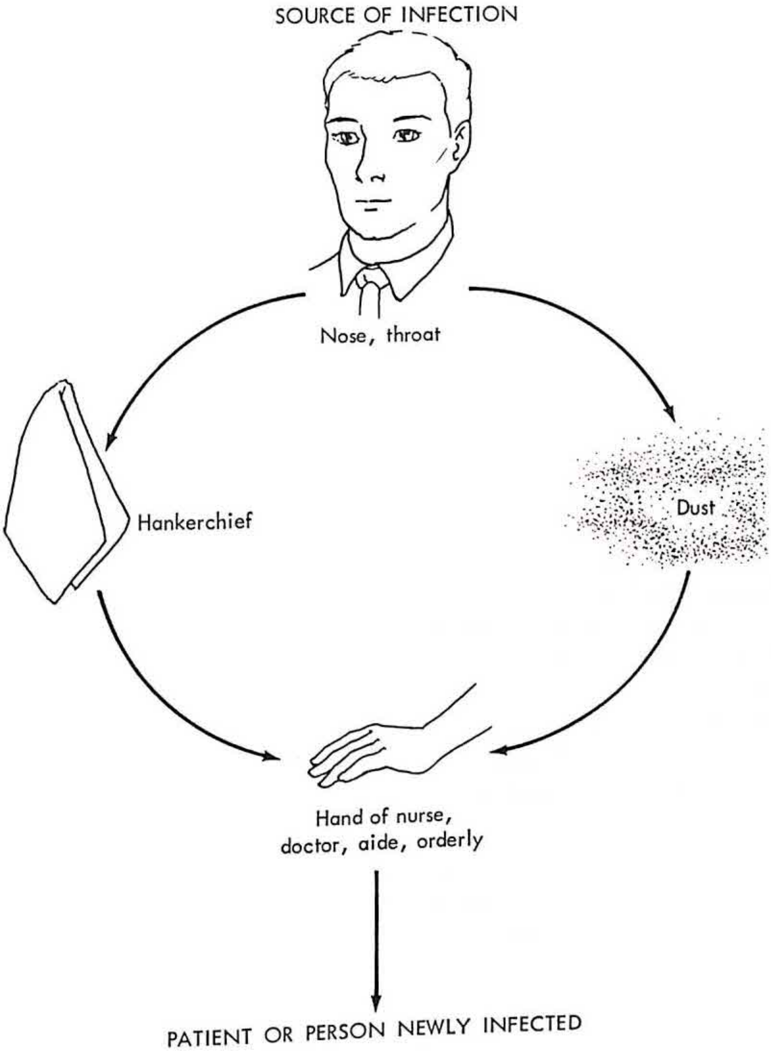
SOURCE OF INFECTION
Nose, throat
Hankerchief
Dust
Hand of nurse, doctor, aide, orderly
PATIENT OR PERSON NEWLY INFECTED

Figure 11–1. Spread of staphylococcus infection.

person, either artificially or naturally. To understand acquired immunity, we must understand antibodies, antigens, and their relationship to phagocytosis and clinical disease. *Antibodies* are protein substances formed in the blood and lymph which help to fight invading microorganisms. Some antibodies appear to do no direct injury to the microorganisms, but make them more susceptible to phagocytosis. *Antigens* are substances that stimulate the production of antibodies. These may be found within the body or introduced artificially. *Phagocytes* are certain types of leucocytes, white blood corpuscles, which are capable of ingesting and destroying microorganisms. The process by which these white blood cells engulf and destroy microbes is called *phagocytosis.*

Immunity acquired naturally results from an attack of the disease. When a child has measles, his body manufactures antibodies and he is not likely to get the disease again. Sometimes a person has a mild form of a disease. He fights it off unnoticed, but in the process his body has built up a lifetime immunity. This is called *active immunity*, that is, the body produces its own antibodies (see Figure 11–2).

Artificial immunity against disease is acquired by inoculating a person with a suitable vaccine, serum, or antigen. Antigens produce active immunity by stimulating the body to produce its own antibodies. It may take from weeks to months for the body to reach the state of maximum immunity but once established, it lasts from several months to several years.

Passive immunity differs from active immunity. To understand passive immunity, we must know what is meant by toxin, antitoxin, and serum (pl., sera). A *toxin* is the poisonous waste product of bacteria. With scarlet fever, it is the toxin of the streptococci which makes the patient ill. The diphtheria bacillus also gives off a poisonous toxin which spreads through the body during the illness. An *antitoxin* is a substance containing antibodies capable of neutralizing a toxin. A *serum* is made which contains antibodies effective against the toxin of the diphtheria bacilli. These antibodies were produced in the body of a horse that had been inoculated with diphtheria bacilli. A person ill with diphtheria is given an injection of serum antitoxin which contains antibodies.

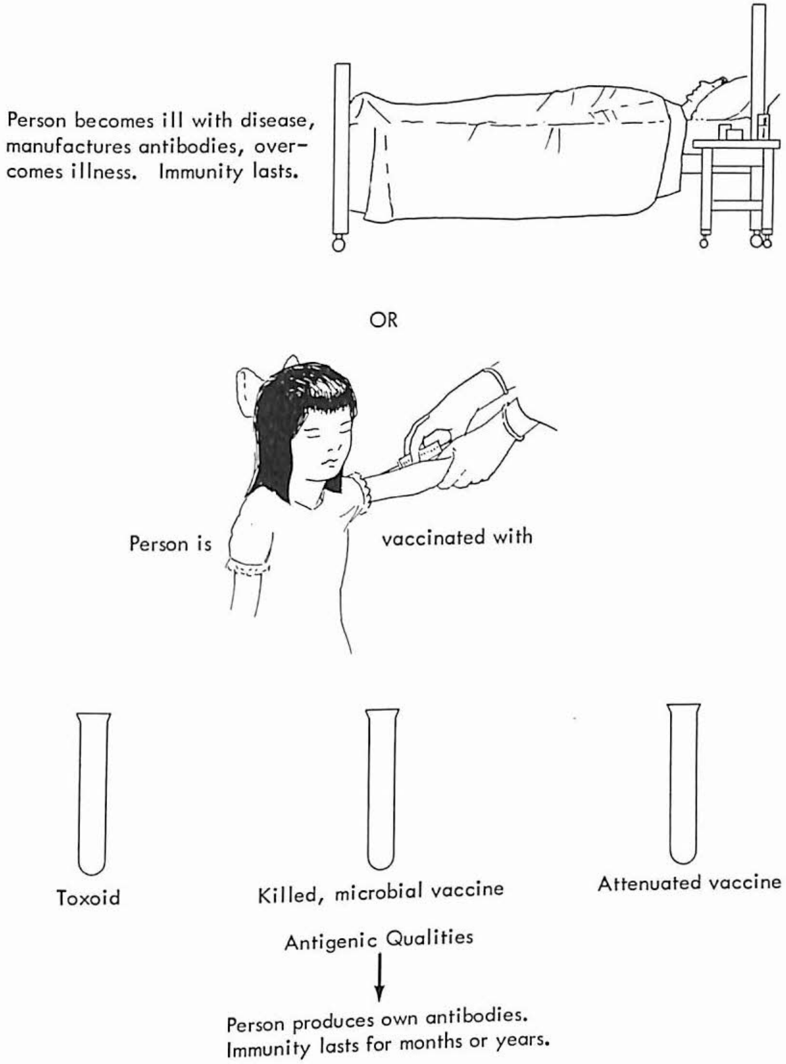
Person becomes ill with disease, manufactures antibodies, overcomes illness. Immunity lasts.
OR
Person is
vaccinated with
Toxoid
Killed, microbial vaccine
Attenuated vaccine
Antigenic Qualities
Person produces own antibodies. Immunity lasts for months or years.

Figure 11–2. Active immunity.

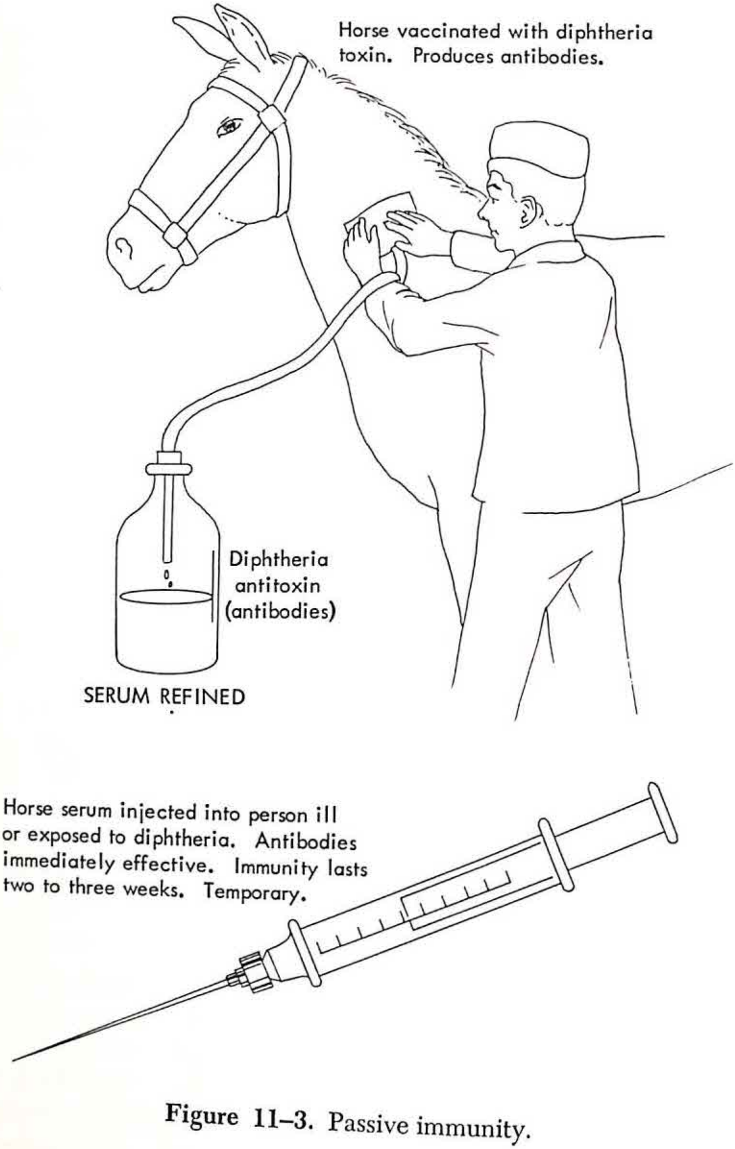
Horse vaccinated with diphtheria toxin. Produces antibodies.
Diphtheria antitoxin (antibodies)
SERUM REFINED
Horse serum injected into person ill or exposed to diphtheria. Antibodies immediately effective. Immunity lasts two to three weeks. Temporary.

Figure 11–3. Passive immunity.

These antibodies help the patient to recover from the disease (see Figure 11–3).

The antitoxins are effective in establishing passive immunity. Passive immunity means that the body received the antibodies and did not manufacture them. Immunity is established by injecting the individual with serum containing antibodies previously developed in the body of an animal and prepared for human use. Passive immunity is established immediately but its duration is short. Because of the short-lived immunity, serum is not used for permanent protection. Its chief value lies in the immediate immunity it produces in a person who has been dangerously exposed to disease, or who is already ill.

Injections of gamma globulin also help to protect an exposed or sick person against a serious attack of the disease. Gamma globulin is the protein fraction of the blood containing antibodies, and is refined from the blood of adults who have had the disease. Gamma globulin injections have proved valuable in fighting many specific diseases.

Passive immunity may also be acquired naturally. Antibodies in the mother's blood can pass across the placenta into the circulation of the unborn child, giving the baby naturally acquired passive immunity.

Methods of Disease Control

Prevention of disease (prophylaxis) is accomplished by three major methods: removing the source of infection, interrupting the chain of transmission, and increasing the resistance of susceptible people.

Removing the source of infection is crucial to the control of communicable diseases. One method is to destroy the nonhuman sources. Rabies has been brought under control by preventing the illness in dogs and by detecting sick dogs or other animals subject to the infection. The rabies virus is present in the saliva of the rabid dog. When the dog bites a person, the virus is transferred directly into the wound. The public has been warned that bats, rabbits, skunks, and other wild animals may be rabid. Rickettsial and arthropod viral diseases occur less frequently in the United States than elsewhere because of the elimination of vector insects. Substantial progress is being made in other parts of the world in destroying vectors, especially mosquitoes. In the decade 1948 to 1958, the worldwide incidence of malaria was reduced by half. Many previously uninhabitable areas of the tropics have been made livable by modern control methods.

It is sometimes difficult to control human carriers. In the classic example of Typhoid Mary, the cook who spread typhoid fever wherever she worked, the New York Health Department was permitted by the courts to take her into custody. She was held in detention for three years. Healthy carriers present difficult problems to health officers.

Isolation is an established method of removing the source of infection. Any case of diphtheria is immediately isolated because the patient is a natural reservoir of infection. Techniques and principles of isolation must be learned thoroughly by every student nurse.

Quarantine is mass isolation in epidemic situations. Nonimmunized persons coming from infected or suspected areas should be isolated for a period equal to the longest incubation period of the disease in question.

To *interrupt the chain of transmission* is an important task for every nurse. Many nursing procedures and hospital policies are planned to prevent disease transmission by mechanical, physical, or chemical methods. Mechanical ways of interrupting the chain include such practices as spacing beds sufficiently far apart, thus decreasing the chance of direct infection by droplet spray from coughing and sneezing.

Filtration and appropriate chemical treatment of water prevent transmission of the pathogens of typhoid fever and amebic dysentery, unless the contamination of the water supply occurs after the water has been purified.

Hand washing and personal cleanliness are highly important to controlling communicable diseases. This is particularly important in preventing serious staphylococcus and streptococcus infection in nurseries for the newborn.

Physical and chemical methods of destroying pathogens are based on manipulating the environment to produce unfavorable conditions for the microorganisms. As has already been stated, in order to live microorganisms must have proper food, moisture, temperature, exposure to oxygen and light, and a medium with favorable pH value.

Temperature control is often used to destroy bacteria. Low temperatures will kill only a few bacteria but will inhibit their growth. Refrigeration of food is based on the principle that low temperatures retard bacterial multiplication. Because bacteria are more sensitive to heat than cold, high temperatures are used for disinfection and sterilization. Disinfection is the destruction of pathogenic organisms. Sterilization is the complete destruction of all microorganisms. Sanitizing involves reducing the number of bacteria to a safe level.

Disinfection is managed by several methods. Dry heat is effective when practical. A needle placed in a direct flame or glassware in an oven can be made sterile. Ordinary boiling destroys many bacteria, but not the spore-forming bacteria. Spore-forming bacteria may be destroyed in the autoclave, which utilizes steam under pressure and produces higher temperatures than does boiling.

Drying is a successful method of preserving some foods, but not all. Spores are resistant to drying, hence if the food has been contaminated with spore-forming bacteria, drying is unsafe.

Pasteurization is a form of sanitizing milk, making it safe to drink by killing the harmful organisms. The harmless bacteria that cause milk to spoil are not destroyed. In the pasteurization process milk is heated to 62°C. (143°F.), held at this temperature for 30 minutes, and then cooled immediately.

Radiation is an efficient method of destroying pathogens when practical. The ultraviolet rays of direct sunlight and x-rays will kill both vegetative and spore-forming bacteria.

Chemicals that destroy microorganisms are called disinfectants (or germicides or bactericides). Disinfectants should not be used on the skin. Antiseptics are agents that prevent the growth or arrest the development of microorganisms. Most antiseptics are safe to use on the skin as they are fairly mild. Fumigation is the method of killing microorganisms by vapor. The nurse should know and use these terms correctly.

The process of disinfection often becomes the responsibility of the nurse. If she is to disinfect properly, the nurse must be familiar with the nature of infectious disease and its mode of transfer. She should be vigilant and disinfect all discharges, excreta, and objects touched by the patient.

The *resistance of a susceptible person can be increased* by increasing his natural resistance or by employing immunization techniques. That a person's general resistance to disease may be strengthened is often overlooked. It has been noted that a robust, healthy person may rebuff almost direct contact with tuberculosis. The same person might succumb to the disease if he were weakened and exhausted by malnutrition, cold, overwork, or some chronic disease. In the laboratory an exhausted white rat will contract anthrax, a disease against which it is ordinarly resistant. The nurse who continually encounters pathogens must constantly strengthen her own general health. She should not allow her resistance to be lowered by such factors as fatigue, poor nutrition, exposure to wet or cold, or use of alcohol.

Proper immunization can prevent a person from succumbing to an infectious disease. The highly developed processes of artificial immunization have had a tremendous impact on the history of mankind. It is cheaper and less painful to vaccinate and avoid the disease than to rely on treatment to cure the disease once it starts. Artificial immunization is accomplished by the use of toxoids, killed microbial vaccines, or attenuated vaccines.

Toxoids are modified toxins, that is, toxins that have been weakened by adding chemicals or by heating. The toxic properties have been removed, but not the antigenic quality. The toxoid will stimuate the body to produce its own antibodies and thus become immunized. Diphtheria, tetanus, and gas gangrene are three diseases for which effective toxoids are available.

Vaccines provoke active immunity by stimulating the production of antibodies. Two main kinds of vaccines have been developed. One kind of vaccine contains dead organisms, organisms killed by heat or chemicals but still retaining their antigenic characteristics. The Salk vaccine against poliomyelitis is a killed, microbial vaccine. The other kind of vaccines contain harmless, living organisms. These weakened, avirulent microorganisms make an attenuated vaccine.

Some pathogens when killed lose their power of antigenicity. The dead organisms no longer stimulate the production of antibodies. Vaccines made from dead tuberculosis pathogens fail to provide protection against the disease, thus it becomes necessary to grow avirulent organisms to produce a vaccine. The B.C.G. (*Bacillus Calmette Guerin*) vaccine against tuberculosis is made from a strain of avirulent organisms derived from cattle.

Other attenuated vaccines include the Sabin vaccine for poliomyelitis, and vaccines for smallpox and yellow fever. All attenuated vaccines incite an extremely slight case of infection, hence killed vaccines have been employed when effective. However, as research continues, techniques are being perfected and safety increasing for attenuated vaccines. The Sabin polio vaccine appears to give a longer immunity against more strains of polio virus than does the Salk vaccine. Both vaccines have the approval of the American Medical Association and have been used extensively in this country and throughout the rest of the world. Table 11–1 gives information on various communicable diseases.

QUESTIONS FOR DISCUSSION

1. Name those diseases of animals which may be transmitted to man.
2. Give suggestions which owners of pets should observe to help prevent animal diseases from spreading to man.
3. Is there any communicable disease which might be said to be endemic in your area?

Table 11–1. *Communicable Diseases*

DISEASE	CAUSATIVE AGENT	HOW SPREAD	INCUBATION PERIOD	PERIOD OF COMMUNICABILITY	IMMUNIZATION	CONTROL MEASURES OTHER THAN IMMUNIZATION
Amebic dysentery (amebiasis)	*Entamoeba histolytica*	Fecal–oral contact, usually indirect through water supply	5–90 days	As long as intestinal infection persists—may be years	None	Sanitary disposal of human feces, water and food sanitation, tests of food handlers
Bacillary dysentery (shigellosis)	*Shigella dysenteriae*	Fecal–oral contact, usually indirect	1–7 days	14–28 days from onset of symptoms	No satisfactory method	Isolation of cases, sanitary disposal of human feces, quarantine of contacts, food and water sanitation
Brucellosis	*Brucella melitensis*	Contact with infected animal or animal products, especially milk	5–21 days	No man-to-man transmission	None for man	Disposal of infected animals and sanitary control of animal production
Chicken pox	*Varicella* virus	Direct and indirect contact	12–14 days	One week after onset	None	Avoid contact if possible
Cholera	*Vibrio cholerae*	Fecal contamination of food and water	1–5 days	1–12 weeks	Active, but efficacy questioned	Isolation of cases, disinfection of feces and vomitus, vacci-

						nation for international travel, quarantine of contacts for 5 days
Diphtheria	*Corynebacterium diphtheriae*	Direct or indirect contact with case or carrier	2–6 days	10–30 days from onset of symptoms	Active: toxoid Passive: antitoxin	Isolation of cases, quarantine of contacts
Gonorrhea	*Neisseria gonorrhoeae*	Sexual contact	3–10 days	Months or years if active infection occurs without treatment	None	Finding cases and controlling exposure
Infectious hepatitis	Filterable virus, probably	Person to person, fecal–oral contact through contaminated food and water	15–50 days	Exact period not known; 14–21 days after onset is period of greatest danger	Passive only; gamma globulin protects for 6–8 weeks	Isolation during first week of illness, disinfection of feces and discharges from nose and throat
Influenza	Influenza virus, types A and B	Direct contact through droplet infection and indirect contact through nasal and oral discharges	1–3 days	3 days at onset	Active, but protects against specific strains only	Isolation of cases acutely ill; avoiding crowds during epidemics

DISEASE	CAUSATIVE AGENT	HOW SPREAD	INCUBATION PERIOD	PERIOD OF COMMUNICABILITY	IMMUNIZATION	CONTROL MEASURES OTHER THAN IMMUNIZATION
Leprosy	*Mycobacterium leprae*	Not known; skin and respiratory tract suspected entry sites	6 months to 5 years	As long as bacilli are discharged from skin and mucous membranes	None	Isolation (compulsory), contact investigation
Malaria	*Plasmodium* *vivax* *malariae* *falciparum*	Anopheles mosquito	10–31 days	Months via mosquito	None	Mosquito control, drug prophylaxis
Measles (rubeola)	Measles virus	Direct and indirect contact with infectious cases	10–21 days	10 days (4 days before and 6 days after rash onset)	Active: live virus Passive: gamma globulin	Avoid exposure; quarantine of no value
German measles (rubella)	German measles virus	Direct and indirect contact	14–21 days	7–14 days from onset	Passive: gamma globulin	Exposure of female children (recommended)
Meningitis	*Neisseria meningitidis*	Direct contact with infectious person	2–10 days	Until treated or cured (2–30 days)	None	Isolation of cases, chemoprophylaxis (sulfa treatment to control carrier)

Mumps	Mumps virus	Direct and indirect contact	12–26 days	16 days (8 days before and 8 days after onset of symptoms)	Available, but effective for only 2 years	Isolation of cases, disinfection of contact articles
Plague	*Pasteurella pestes*	Bite of infected flea	2–6 days	3–15 days	Active: vaccine (gives some protection for several months)	Isolation of cases, control of rats and fleas, quarantine of contacts
Poliomyelitis	Poliomyelitis virus	Direct contact through close association	3–21 days	3–6 weeks	Killed or live vaccine (Salk or Sabin)	Not now needed
Rabies	Rabies virus	Bite or saliva from infected animal	4–6 weeks	3–10 days in rabid animal	Active: Pasteur treatment after exposure by bite of animal	Regulation and vaccination of dogs
Scarlet fever	*Streptococcus pyogenes*	Direct and indirect contact, droplet infection	1–3 days	10–20 days from onset of symptoms	None	Isolation of cases (no quarantine), pencillin treatment of cases, prophylaxis
Smallpox (variola)	Variola virus	Direct and indirect contact	7–16 days	14–21 days, from symptoms to scab loss	Live vaccine	Isolation of cases, quarantine of people exposed

DISEASE	CAUSATIVE AGENT	HOW SPREAD	INCUBATION PERIOD	PERIOD OF COMMUNICABILITY	IMMUNIZATION	CONTROL MEASURES OTHER THAN IMMUNIZATION
Syphilis	*Treponema pallida*	Sexual contact	10–60 days	2–4 years, or until treated	None	Finding cases and controlling exposure
Tetanus	*Clostridium tetani*	Contamination by spores of breaks in skin	4–21 days	Not applicable	Active: toxoid Passive: antitoxin	Careful cleaning of all wounds
Thrush (candidiasis)	*Candidia albicans*	Childbirth contact and endogenous activities	2–5 days (infants)	From direct lesions	None	Isolation in nurseries, treatment of postantibiotic activation cases
Trichinosis	*Trichinella spiralis*	Eating incompletely cooked pork with viable trichina	2–28 days	No man-to-man transmission	None	Proper cooking and processing of meat, cooking of garbage before feeding to hogs
Tuberculosis	*Mycobacterium tuberculosis*	Airborne infection from active cases	21–48 days	As long as case is active, with discharge of bacilli	BCG vaccine (little used in U.S.)	Finding, isolating, and treating active cases; following up arrested cases

Typhoid	*Salmonella typhi*	Direct and indirect contact with case or carrier	2–21 days	7–90 days, but some permanent carriers	Available for highly exposed persons	Isolation of cases, control of human excreta, water and food sanitation
Whooping cough	*Bordetella pertussis*	Direct contact with infectious person	7–21 days	25–45 days from start of symptoms	Effective agents available	Isolation of cases, quarantine of exposed individuals
Food Poisoning						
Salmonella	*Salmonella enteritidis* (et al.)	Through contaminated food	6–48 hours	3–21 days	None	Exclusion of infectious persons as food handlers, disinfection of feces and soiled articles
Staphylococcal	*Staphylococcus albus* (et al.)	Food contamination with toxin-producing staphylococcus	1–6 hours	Depends on original source	None	Food sanitation, exclusion of persons (food handlers) with purulent skin lesions
Botulism	*Clostridium botulinum*	Inadequately processed canned food	12–30 hours	Not applicable	Antitoxin	Strict food-processing control

4. Has an epidemic occurred in your vicinity recently? If so, what action was taken?
5. What are the symptoms and treatments for food intoxications and food infections?
6. List common chemical agents that are used for disinfectants and antiseptics. Give uses and common recommended strength.
7. What is the purpose of the Schick test? The Wasserman test?
8. Why is it important for parents to keep an accurate record of all immunizations, with the exact dates of administration, and all childhood illnesses and their dates?
9. List the communicable diseases which you have had. List the communicable diseases against which you have received protection through immunization.

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PART III

Home Hygiene

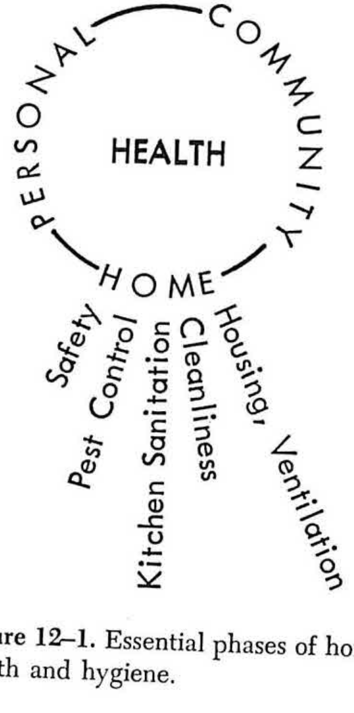

Figure 12–1. Essential phases of home health and hygiene.

Chapter 12

HOUSING AND HEALTH

Proper housing facilitates the hygienic practices necessary to maintain family health and, in turn, community health. Housing shelters man from the elements of nature and influences the type of life its inhabitants live. Good housing ensures comfortable living, permits privacy, and furnishes space needed for the family's activities. Attractive surroundings and convenient work areas contribute to personal well-being and make relationships with others more pleasant. Good housing is an aid to building both physical and mental health. The practical nurse needs to recognize the importance of good housing in terms of personal health and community health.

First, let us consider the importance of housing, what constitutes good housing, and how to ventilate living quarters for healthful living. In following chapters, we shall explore aspects of cleanliness in the home, kitchen sanitation, control of household pests, and home and recreational safety. In the chapter on environmental health, we shall discuss the action of the community and the local health board toward good housing.

The practical nurse who is knowledgeable in the health aspects of home environment can be a positive force in creating good health in the community. In order to relate health to housing, she must have a broad appreciation of the multiple housing standards and housing regulatory bodies.

Poor Housing and Its Effects

Too little space, lack of fresh air, inadequate heat and light, insufficient sanitary facilities, and poor maintenance are characteristic of substandard housing. Blighted areas in cities are increasing where stable neighborhoods are breaking up and the established families are moving to suburbs in large numbers. Too often the large, old houses are made into multifamily dwellings—repairs are neglected and decadence sets in.

The low-cost houses which surround every major U.S. city are also potential slums. Many inexpensive suburban developments are poorly planned. They have improper sewage disposal in faulty septic tanks, drinking water drawn from the ground level of the septic tank, houses with tiny rooms on lots that are too small, and houses with inadequate ventilation, light, and heat. These conditions comprise poor housing and slum conditions even though located in a suburb.

Illness, disease, and accidents are high in areas of poor housing. Where there is overcrowding, there is a higher incidence of infectious diseases, such as tuberculosis, measles, and poliomyelitis. Unsanitary conditions make possible typhoid fever, paratyphoid fever, and cholera, diseases which rarely occur where good sanitary facilities are maintained and strict cleanliness practiced. Lack of personal hygiene can result in skin conditions such as scabies, impetigo, and ringworm. Accident rates are high in buildings not well maintained. In many cities, one third of the fire department's time is spent in blighted areas. The same blighted areas have high rates of delinquency, crime, and venereal disease. Of course, poor housing is not the only factor. In general, poverty, ignorance, and low standards of nutrition and personal cleanliness are found in slums.

These conditions are not hopeless, however. Families have been and are being rehabilitated. Often the first step is to provide satisfactory housing. During one three-year period of working with multiproblem families in Indianapolis, the Family Service

Association obtained particular success with one large family.[1] When first contacted, the family of twelve people were living on $45 weekly, in a four-room, semimodern apartment. Three years later, the father was earning a more adequate income, much of the family's conflict had dissolved, and one son had moved from a correctional institution to college enrollment. In addition to help in solving their social problems, the family had been relocated in a four-bedroom, fully modern home next door to a neighborhood recreation center. This family had progressed enough to open their home to two neighborhood teenage girls as a haven from an alcoholic mother and a deprived home environment.

Solving housing problems will not take care of all health and social problems, but investigations have shown that social reform and health improvement are impossible in areas of poor housing.

OVERCROWDING DEFINED

Lack of room refers to both room crowding and lot crowding. Measurement of overcrowding has been expressed by the number of persons per room. Room density greater than one person per room has been related to the general death rate and prevalence of communicable disease. Having more persons than rooms has been defined as crowding, and more than two persons per room as overcrowding. These are unsatisfactory standards, however, as a room with cross ventilation may be well ventilated with several persons in it, while one room lacking cross ventilation would be unsatisfactory for one person.

Lot overcrowding often accompanies overcrowding, and further compounds health hazards. As in the individual dwelling, density of population is one dependable measure. Land crowding has been most common with apartment buildings, especially those of the highest and lowest income groups (see Figure 12–2).

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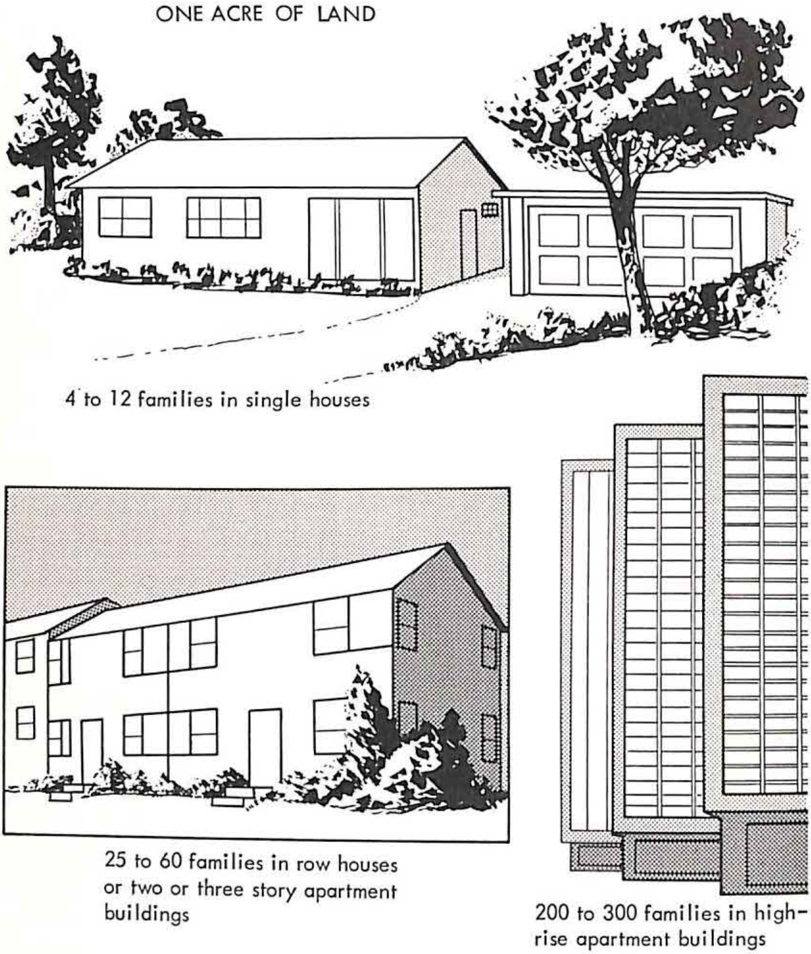
[1] "A Three Year Demonstration in the Rehabilitation of Sixteen Families" (unpublished report of Family Service Association of Indianapolis, February 22, 1961).



ONE ACRE OF LAND

4 to 12 families in single houses

25 to 60 families in row houses or two or three story apartment buildings

200 to 300 families in high-rise apartment buildings

Figure 12–2. Kind of housing determines population density.

One acre of land may be occupied by from four to twelve families in single houses. With row houses or two- or three-story apartments, the density may be twenty-five to sixty families per acre. High-rise apartments on costly land have resulted in 200 to 300 families per acre. Because of the desire for large rental returns, 80 per cent of the lot has been covered by the structure.

In the past it was recommended that not more than 30 to 50 per cent of the lot should be covered by a many-storied apartment building,[2] and these standards probably should still prevail.

CHOICE OF HOUSING

The type of housing varies with the geographical area of the country. When traveling across the United States, you may have noted the row houses in Philadelphia, the adobelike structures in the Southwest, the "double" or duplex houses in the Middle West, apartments in New York City, and the garden apartments in California. Ten per cent of the American people live in mobile homes. Architectural styles were once related to certain geographical areas, such as the Cape Cod cottage, the Southern Colonial mansion, and the California-style ranch house. Even though these are now found everywhere, house design is most satisfactory when adapted to the climate and terrain.

Cost of housing is often the most limiting of all factors. Many times, people take the best they can afford and then make changes so it will be more useful to them. Many young couples plan carefully for the home they want, and feel justified in paying as much as they can afford for a suitable house. Home ownership can be a goal in itself or it can contribute toward the ultimate goals of privacy, comfort, security, and health.

Basis of Healthful Housing

The Committee on Hygiene of Housing for the American Public Health Association has defined the principles of healthful housing in four categories: [3]

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[2] Tessie Agan, *The House, Its Plan and Use* (Philadelphia: Lippincott, 1948), pp. 63–69.

[3] *Basic Principles of Healthful Housing* (2d ed.; New York: American Public Health Association, 1961).

1. Fundamental physiological needs
2. Fundamental psychological needs
3. Protection against contagion
4. Protection against fire and accidents

Under *fundamental physiological needs* are included such items as proper heating and ventilation, artificial and natural light to prevent glare, daylight in living rooms, facilities to permit household tasks to be performed without undue fatigue, and adequate space for children's play.

Psychological needs means adequate privacy for each individual, opportunity for normal family and community life, esthetic enjoyment of the home and its surroundings, and adjustment to prevailing social standards of the community.

Under *protection against contagion* are included such items as water supply of safe and sanitary quality, cleanliness of dwelling and of the person, house structure able to exclude rodents and vermin, sanitary sewage disposal, protective containers for garbage and rubbish, provisions for prompt removal and disposal of garbage, and facilities for keeping milk and food from decomposing.

Protection against accidents includes protection against gas poisoning, falls, mechanical injuries in the home, electrical shocks and burns, and fires in the house and on the grounds. It also includes protection of the neighborhood against traffic accidents.

Building codes and housing ordinances are made and enforced by local government units in efforts to protect health by requiring safe plumbing, sewage and garbage disposal, elimination of nuisances, and safe construction. Frequent updating is necessary for effective results.

Housing Standards

To provide a basis for granting mortgage insurance on houses, the Federal Housing Administration has defined suitable standards. The minimum property standards established by the FHA are generally accepted. A complete description of these regulations is published in the FHA book, *Minimum Property Standards for Properties of One and Two Living Units*.[4] The regulations cover materials and products; structural design; mechanical equipment, such as heating and air conditioning; construction of all parts of the house; exterior and interior covering materials; water supply and sewage disposal systems; general planning; plot planning; and general acceptability.

Many specific, detailed standards are described under each category. The following are listed under "building planning."

1. Natural light shall be provided. Total glass area not less than 10 per cent of floor area for all habitable rooms, except kitchen.
2. Provide natural ventilation. Net area not less than 4 per cent of floor area. (All habitable rooms except kitchen.)
3. Detailed requirements given for kitchen storage.
4. Privacy is assured between bedrooms and bath by requiring each bedroom to have access to bathroom without passing through another bedroom or habitable room.
5. Each bedroom must have at least one closet with minimum depth of 2 feet, minimum width of 3 feet.
6. Rooms must have ceilings at least 7½ feet high. Main entrance doors must be at least 3 feet wide; doors to most interior rooms, 2½ feet wide.
7. Minimum square foot areas and minimum dimensions for each room are listed:

	L.R.	D.R.	K.	Total B.R.	Min. B.R.
1-B.R. unit	160	80	60	120	–
2-B.R. unit	160	80	60	200	80
3-B.R. unit	170	95	70	280	80
4-B.R. unit	180	110	80	380	80
Least dimension	11′	8′	3–4′	–	8′

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[4] *Minimum Property Standards for One and Two Living Units* (Washington, D.C.: Federal Housing Administration, Department of Housing and Urban Development, FHA No. 300, General Revision No. 5, 1965).

Desirable Housing

The FHA housing standards define the minimum conditions; that is, they describe the level below which housing is considered unsafe or unsanitary. The standards do not necessarily represent the most desirable housing. The Small Homes Council of the University of Illinois has established higher standards than the FHA. Regarding the actual size of a house, the Small Homes Council recommends 1,500 square feet of living space, exclusive of bathrooms and closets, for a family of four. Many homes in the popular price range have little more than 1,000 square feet of actual floor space.

Livability and maximum satisfaction derived from a house depend upon such factors as adequate room size, easy flow of traffic, ample storage areas, and relationship of rooms to offer privacy.

For privacy, a bedroom for each person is ideal. A room shared by one other person is next best. Except for married couples and very young children, rooms should be shared only by persons of the same sex. Separation of sexes should occur by age eight, or by ten at the latest. For sleeping, young children should be separated early from their parents, and certainly by the age of two.

Well-planned and organized living quarters permit the work of the home to be carried on without excessive fatigue. The kitchen is the center of activities, and should be designed with areas for food preparation, washing dishes, cooking, and storage of food and equipment. A convenient, cheerful kitchen is an asset; a poorly planned, poorly lighted kitchen is a handicap. The laundry and study are other areas that require special attention. An attractive dining area makes possible the fullest enjoyment of family meals. A living room or family room provides for activities of family members. Relaxing in comfort means chairs of proper size, couches that are firm but still yielding, conveniently placed tables, and good lighting. Suitable play space for children is most important. A well-planned home allows for companionship as well as privacy.

APARTMENT LIVING

Living in an apartment is convenient, economical, and easy but is more likely to be satisfactory for one person or a couple than for a large family. Too often, apartment living deprives the family of freedom and privacy. Families with children need play areas, both indoors and outdoors. Many modern apartment buildings offer facilities usually expected only in the single house—laundry room, workshops, recreation rooms for parties, swimming pools, and spare bedrooms that families may rent when they have guests. Location of apartment, type of renters, and whether the building is fireproof are also factors to consider.

LOCATION OF HOME

Today's trend toward more outdoor living has increased the importance of the house site, orientation of the house, and the nature and layout of the lot. Neighborhoods change too, and this influences the value and pleasure that a family derives from a house. Both the American Public Health Association and the Federal Housing Administration recognize the need to analyze house locations. The APHA includes an environmental survey as part of its appraisal method for measuring the quality of housing. The FHA in its Minimum Property Standards has established certain site conditions and sizes of lots.

Zoning ordinances are a form of local control used to regulate and protect residential areas, to prevent concentration of population, to insure adequate light and air, and to promote health and the general welfare. True effectiveness depends on the extent to which zoning ordinances are revised and kept up-to-date. From the householder's view, a cheerful, clean location free from excessive noise and smog greatly enhances the livability of a house. Convenience to transportation and shopping centers are particularly important to elderly people.

Fresh Air and Sunlight

Housing standards incorporate requirements intended to help people enjoy the benefits of sunlight and good air. Utilizing these features is the responsibility of the individual citizen.

Houses are built with window area in relation to room size. Every living and sleeping room should have a minimum of one-half hour of direct sunlight daily. Sunlight is both a morale builder and a health booster, and aids in cleanliness and in destroying microorganisms. Most pathogenic microorganisms die when exposed to direct sunlight. Homemakers should raise the blinds, pull apart the drapes, and let in the sunlight.

Sunshine and fresh air act as general tonics for health, promoting a sense of well being. Everyone should spend part of every day out of doors. The changes in temperature of outside air are invigorating. The person confined indoors, the chronic invalid, misses the stimulation. Indoors, we strive for good ventilation and for fresh air to breathe. Every room should have at least one window that can be opened for ventilation.

Good and Bad Ventilation

With careful attention to existing facilities, most living quarters can be properly ventilated to supply good air to breathe. Good air has the right temperature, humidity, circulation, and freedom from undesirable odors and pollutants.

"Bad air" is easier to recognize than to understand. A short time in a hot, stuffy, malodorous room can cause physical discomfort, restlessness, or a headache. Prolonged exposure to such conditions can lead to nausea, dizziness, loss of appetite, digestive disturbances, and general discomfort.

It is now known that the short-term ill effects of defective ventilation are not the result of excess carbon dioxide or lack of oxygen in the air. The ill effects result from conditions that influence the heat-regulating mechanism of the body. These conditions are improper temperature, high relative humidity, and lack of air movement. Although each of these elements affects the others, a separate consideration may further the understanding of the student nurse.

Room Temperature

A temperature between 20°C.–21°C. (68°F. and 70°F.) is most conducive to the general comfort and well being of most people. The human body produces heat as it oxidizes food. The excess heat is continually lost by breathing, by warming cold foods that are eaten, but mainly through the skin. The air surrounding a person should be of the temperature that allows the heat loss to be balanced by the heat produced. The room temperature of 20°C. (68°F.) produces this balance.

Sustained lower temperatures may lead to chilling, less body resistance to disease, and lowered work efficiency. Continuous exposure to higher temperatures leads to excessive perspiration, loss of salt, susceptibility to infection, and general weakness. Fatigue results because the body's natural energy is depleted by the need to combat heat.

Many people prefer a bedroom temperature slightly lower than the living room temperature and a slightly higher temperature for the bathroom. A good heating system does not create drafts, maintains even temperature within a room, and makes possible cool bedrooms, warmer bathrooms, and "happy medium" living rooms. A variation in temperature from floor to ceiling should be avoided. If possible the 20°C. (68°F.) temperature should be maintained at both foot and head levels.

The type of heating system should be carefully chosen, taking into consideration climate, size of building, and available fuel. Steam heat has proven satisfactory for large buildings, and warm air furnaces adequate for moderate-sized compact homes. Properly installed electric heating provides even heat and allows for different temperatures in different rooms.

In summertime, many people are comfortable in temperatures from 24°C.–27°C. (75°F. to 80°F.) with appropriate relative humidity and air movement. Great contrasts in temperature are to be avoided at any season. Because passing from overwarm rooms to cold outside winter air may predispose one to colds, it is undesirable to have high indoor temperatures in winter. With summer cooling, a difference of 10°C. to 15°C. between inside and outside temperatures is generally recommended. Too great a contrast between indoor and outdoor temperatures has been known to contribute to the occurrence of heat strokes.

The householder can do much to help keep the house warmer in winter and cooler in summer. The following will help: insulate the house; close blinds and shutters on very cold days and very hot days; seal cracks around doors and windows; install storm doors and windows on sides with windy exposures; avoid more than 5 degrees difference between day and night thermostat setting; have heating and cooling systems checked regularly; and learn to operate the heating system efficiently.

Humidity

The amount of moisture in the air greatly influences body comfort. Relative humidity is the relation between the actual moisture content of the air and the total amount it could hold at this temperature. It is expressed in percentages. Cold air will not hold as much moisture as warm air. For example, −12°C. (10°F.) air at 100 per cent humidity will contain less moisture than air at 20.6°C. (70°F.) at 10 per cent relative humidity. The capacity of air to hold water increases with rising temperatures and decreases with lowering temperatures.

Humidity in rooms should decrease as outdoor temperatures decrease. The following table shows the recommended indoor relative humidity for typical outdoor winter temperatures. Too high humidity on cold days will result in excessive condensation on windows, and inside walls that "sweat."

Outside Temperature	Relative Humidity Per Cent
−29°C. (−20°F.)	15
−23°C. (−10°F.)	20
−18°C. (0°F.)	25
−12°C. (10°F.)	30
−6.6°C. (20°F. and above)	35

Low humidity is often a winter problem. Indications of dry air are static electricity in carpets and fabrics, cracks or checks in woodwork, and furniture with loose or broken glue joints. If frost does not form on windows when the outside temperature is −18°C. (0°F.), the house lacks moisture. Lack of humidity in the air is not healthful. It dries out mucous membranes in the nose and throat, which means less protection from invading microorganisms and an increasing occurrence of colds and nose and throat infections. The nose and throat function better when the air has a relative humidity of about 45 per cent.

Ordinary corrective methods, such as placing pans of water over radiators, usually prove ineffective because not enough water evaporates to raise the humidity. Humidifiers are available in a variety of sizes and types. Plug-in portable or console units are easy to install. Power humidifiers are attached to the furnace and connect directly to the warm air supply or cold air return of the furnace. The moisture-laden air is then circulated through the furnace ductwork to all parts of the house.

Dehumidifiers are useful to remove excess moisture from summer air. Some appliances are manufactured with automatic controls to add or remove moisture as needed.

Humidity and Temperature

The most favorable room temperature depends on humidity and air movement. The recommended 20°C. (68°F.) temperature needs a relative humidity of at least 50 per cent.

In dry air, the normal body perspiration evaporates rapidly with a corresponding cooling effect on the body. When the air in a room is 27°C. (72°F.) with 20 per cent humidity, perspiration evaporates quickly. This air may seem cooler than air with a temperature of 18°C. (65°F.) but 60 per cent humidity. When people feel cold in a room with a temperature of 22°C. (72°F.), doubtlessly the humidity is low.

It is generally understood that in summertime, moist air at a high temperature feels warmer than air of the same temperature with a lower moisture content. Damp, moist 32°C. (90°F.) air in Indiana is much more uncomfortable than dry 32°C. (90°F.) air in Arizona. High humidity prevents the rapid evaporation of perspiration, which is the body's cooling method.

Air Circulation

Proper movement of air greatly lessens the discomfort of high temperature or high humidity. The skin is actually a sense organ, registering the physical effect of air upon the body. You may feel uncomfortably warm in a still room with no air movement; step outside the house and you are more comfortable in air of the same temperature, but moving. Moving air changes the aerial blanket surrounding a person and increases heat transfer and evaporation.

In winter, natural ventilation occurs in most homes with the opening and closing of doors, and the normal leakage of air through walls, ceilings, ventilating flues, chimneys, and the imperfect seal around doors and windows.

In warmer weather, subtle movement of air may be obtained by proper opening of windows. A single window may be opened from the top and the bottom; or one window may be lowered from the top and a second window in the same room raised from the bottom; or the window in an adjoining room may be opened and the door left ajar.

Careful placement of electric fans greatly contributes to summer comfort. Each has a purpose: a kitchen exhaust fan; attic fan to draw cool air through the house after sunset; revolving floor fans to keep air moving; and window exhaust fans (Figure 12–3).

In large buildings occupied by many people—schools, churches, offices, and factories—natural ventilation is inadequate and various mechanical systems are utilized by ventilating engineers.

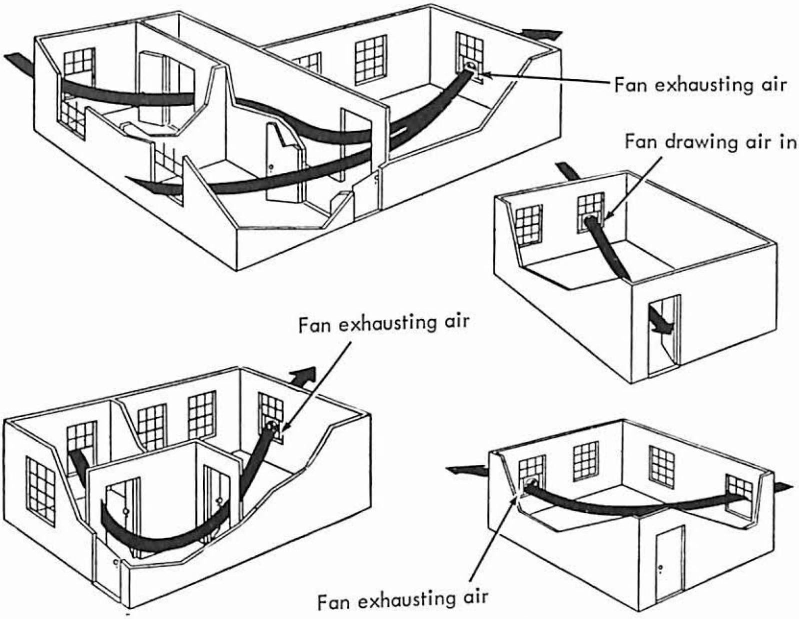

Figure 12–3. Using a window fan in different situations.

Air Conditioning

In addition to controlling temperature, air conditioning regulates humidity, provides for air movement without drafts, and eliminates dust, smoke, pollens, and certain odors. It helps to provide an ideal climate.

When air-conditioning systems were developed and made practical for industry and private homes, a major transformation occurred in the lives of many people. Some people list air conditioning as one factor making possible the increased prosperity in the southern United States. Industrial surveys show that improved efficiency of workers results when temperature and humidity are properly regulated.

Air-conditioning systems are available as a central heating-cooling unit, a separate central unit, or as individual room air conditioners. It is advisable to plan for air conditioning along with heating systems for a new home.

Proper installations yield the best results. Air-conditioning systems are more effective and economical with good insulation and outside shade.

HOUSING AND THE COMMUNITY

Housing is both a personal problem of attaining a good home and a public problem of housing all families. In Chapter 21, housing will be discussed from a community viewpoint.

QUESTIONS FOR DISCUSSION

1. Each student select one location—house or apartment—and evaluate living quarters according to such factors as location and size in relation to number of occupants. Does the home fulfill most of the standards established by the American Public Health Association? By FHA standards?
2. What housing features do you rate essential, over and beyond minimum standards?
3. Analyze the ventilation of your classrooms and/or your home. Are improvements needed?
4. Record the room temperatures for one week, and note the temperature at which you feel most comfortable. Is humidity involved?

5. Temperature and ventilation have been considered for the healthy person. What adaptations are needed for the bed patient? For the convalescent person?

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Chapter 13

A CLEAN HOME

Your knowledge of pathogenic organisms should convince you, the student nurse, that cleanliness is essential to good health. The nurse in the hospital consistently observes cleanliness routines. To maintain a clean home is also important to the nurse. Today comparatively few practical nurses are employed to care for the patient in a home situation. However, practicing reasonable cleanliness in the home helps to protect and preserve the health of the nurse and her family.

We have said that the nurse's good grooming habits will help her to teach good grooming to the patient or to the teen-ager. Observing cleanliness routines in her own home will also help the nurse to teach cleanliness routines to the tuberculosis patient or to the family on a home visit in public health nursing.

Dust Is Reservoir for Bacteria

Dust and dirt contain the bacteria of many diseases and usually provide the food, moisture, and warmth which bacteria require in order to thrive. The flying dust particles provide a means of mobility for the bacteria.

Dust assumes a significant role in causing respiratory diseases, helping to spread the bacillus causing tuberculosis. The tubercle bacilli can live for weeks in dark places protected from sunlight.[1] Tubercle bacilli laden dirt has been vacuumed from cushions, upholstery, and rugs in the homes of "consumptive" families.

A relationship has been established between house dust and asthma and other allergies. House dust ranks with ragweed as a major offender in bronchial asthma, allergic rhinitis (allergic colds), and even certain types of eczema.

The health of small children can be menaced by playing close to dirty floor coverings.

Over a period of time, excessive house dust tends, in some persons, to reduce the appetite and to cause malnutrition.

From an esthetic view, a clean home is a morale builder. It is evidence of pride in one's home, family, and self.

In the hospitals great care is needed to prevent the spread of staphylococcus infection by dust particles. Tragic infections in the delivery room have been traced to poor housekeeping.

The Bases for Cleanliness

Sunshine, fresh air and ventilation, essentials to a healthy, comfortable home have been discussed in the preceding chapter.

With proper ventilation the bedrooms are not overcrowded. The ideal situation is for each child to have his own bedroom, but if this is not possible, each child should have his own bed.

A regular schedule of cleaning at frequent intervals does not permit dirt and dust to collect. Table 13–1 suggests a tentative schedule for household tasks.

Personal habits of family members can help to minimize dust and simplify dirt removal. Encourage each individual to clean muddy shoes, use wastebaskets, watch for cigarette ashes, and wash his hands frequently.

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[1] *Devices That Destroy the Tubercle Bacilli* (Indianapolis: Indiana State Board of Health, revised 1959).

Table 13–1. *Sample Schedule of Household Tasks*

DAILY	WEEKLY	OCCASIONAL TASKS
Living areas		
Open windows briefly to clear air	Vacuum carpets thoroughly	Brush and clean walls
Empty ash trays, wastebaskets	Use attachments on upholstery, pillows, drapes, blinds	Wax floors
Pick up newspapers, magazines	Dust and polish wood furniture and floors	Have rugs cleaned commercially
Dust furniture	Dust mirrors, pictures, light fixtures and bulbs	Clean window shades, blinds, radiators
Go over floors as needed (carpet sweeper or dry mop)	Clean radiators and window sills	Shampoo upholstered furniture and lampshades
Remove spots on woodwork and furniture	Remove objects from dining buffet for thorough dusting	Wash windows, mirrors, picture glass
Put all furniture in place	Clean leaves of green plant	Clean silver as needed
Water potted plants as needed		
Discard wilted flowers		
Bedroom (also)		
Above suggestions, if applicable	Strip bed and turn mattress	Thoroughly clean and air clothes closets
Hang clothes to air or put in laundry	Collect items to be laundered	
Air bed linen while breakfasting	Vacuum or shake rugs	
Make bed		

Kitchen (also)		
Wash dishes Clean work surfaces Wipe off range and refrigerator Empty garbage and reline container with paper Sweep floor	Clean and defrost refrigerator Clean range Scrub out garbage can Wash floor Clean and air vegetable bins and cake boxes Family laundry	Clean drawers and cabinets Wash cabinets and woodwork
Bathroom (also)		
Spread out shower curtain to dry Wash floor of shower stall Wash basin, faucets, toilet bowl When needed, clean towels and washcloths Clean tub after each using	Use disinfectant in toilet bowl Replace towels, bathmats, rugs with clean ones Wash floor	Clean out medicine cabinet Use disinfectant in water to cleanse basin, tub and floors

Efficient Cleaning Methods

Some cleaning methods help to prevent the spread of bacteria, whereas others tend to allow bacteria to thrive. Sweeping with the old-fashioned broom is a questionable practice, especially if there is known contamination in the house. The broom tends to deposit the dirt (and the bacteria) in another spot. The staphylococci are particularly adept in surviving. The goal is to remove the dust and exclude the dirt, not simply to "rearrange" it. Avoid all agitation of dust. Change bedding without shaking the linens.

An efficient vacuum cleaner draws the dust and dirt inside the cleaner. A vacuum cleaner with an air outlet is not recommended for the tuberculosis patient's room, because bacilli in the dust may be circulated again into the air. Dust particles cling to the slightly dampened dust cloth or dust mop. It is important to launder dust mops and dust cloths after each using. Do not use heavily oiled mops or cloths. Soap and water provide the best and simplest method of cleaning. Scrub with generous amounts of water and use friction where feasible; as the dirt is washed down the drain, so are the bacteria.

A pile of newspapers and magazines tends to accumulate dust and dirt. Eliminate old papers, empty wastebaskets, and carry out the trash regularly. The number of decorative objects in a home reflects personal taste. The scrupulous homemaker realizes that bric-a-brac needs to be dusted or washed frequently. In times of illness, it is wise to remove all unnecessary items from the sick room.

Routines for the Working Wife

The woman who works full time and also manages her home frequently has conflicting loyalties. Many student nurses are women with families. If you are a student nurse with a family at home, you undoubtedly understand the problem. You are learning the relationship of cleanliness to health. Yet if you maintained an immaculately clean home all the time, you would do nothing else but clean the house, which you cannot, of course, do. It is necessary to distinguish between essential and nonessential tasks.

It may help to remember that normally active people who genuinely live in a house will clutter the rooms at times. You cannot sew or assemble model airplines or design a mosaic tile ashtray without some confusion. Some women are overly fastidious housekeepers, too strict and too rigid to permit comfortable living. One can become obsessed with housekeeping.

By concentrating on the essential health aspects of cleanliness, you will likely keep the right perspective. Two rooms that must not be neglected are the kitchen and the bathroom. Because the kitchen is the scene of food preparation, we will discuss the kitchen cleanliness factors later. Right now, let us consider the necessary precautions to observe for the bathroom.

Bathroom Cleanliness

The bathroom is usually kept warmer than other rooms of the house. For the sake of privacy frosted window glass is installed which keeps out the direct rays of the sun. There is usually much moisture in the air. If food is supplied, bacteria have the ideal media for growth—warmth, moisture, darkness, and food.

Personal needs of the family members are taken care of in the bathroom—brushing teeth, bathing, and eliminating body wastes. Body wastes normally contain bacteria, and with illness, pathogenic bacteria will be present. All the family members use the bathroom, and pathogens may be spread from one person to another. Small children learning toilet control also have occasional accidents.

For these several reasons the family bathroom requires daily attention. The frequency of thorough cleaning depends upon the number of people using the bathroom. A bathroom used by six people will require more frequent cleaning than a bathroom used by one person.

The soap and water routine is essential. Scrub with lots of water and rinse the dirt down the drain. Cleanse the lavoratory daily and the tub after each use. The soap dish should be scoured and the wastebasket emptied each day. The toilet or the commode will need frequent cleaning with a strong cleanser. The brush and the sponge or cloth used to clean the bowl and toilet seat should not be used elsewhere. Ventilate the bathroom. Occasionally use a sanitizing agent to ensure reducing the number of bacteria present. Chlorine bleach, or a similar mild disinfectant, in the mop water is helpful. Because of the extra moisture in the room, the clothes hamper should be located somewhere else. In any location, the clothes hamper should have proper ventilation.

Sanitizing Home Laundry

If soiled clothes are thoroughly washed, rinsed, and dried, the number of bacteria will be reduced. Detergents act as germicides if the wash water is 71°C (160°F.). Even pathogenic bacteria on clothes are destroyed if the washwater is held at a temperature of 60°C (140°F.) for twenty minutes. The automatic dryer or line-drying will not kill all the bacteria on fabrics, but the number of bacteria will be reduced. For ordinary purposes, most of the bacteria are gone if the clothes are clean. Extra measures are required in known contaminated situations in which purulent discharges are present. Some pathogenic bacteria can survive ordinary home laundering.

Formerly, homemakers boiled clothes. If appropriate equipment is available, boiling of contaminated fabrics is successful. When automatic laundry equipment is used, suitable disinfectants can be added to the wash water which will prevent or reduce the spread of pathogens by clothing and household textiles. These disinfectants include pine oil, liquid chlorine bleaches, phenolic disinfectants, and quaternary compounds. Labels on the containers include directions.

Pride in Cleanliness

Cleanliness is essential to good nursing care. The nurse with whom good habits are automatic will practice reasonable cleanliness in her own home or wherever she is.

The fully confident nurse does the necessary work whenever it is required. An emergency cleaning task is not beneath her dignity. She is also able to direct proper cleaning of a contaminated area. She does her best to function as a nurse wherever she is.

The nurse should recognize that the housekeepers at the hospital have important tasks. An occasional complement to the housekeeper may help her to feel pride in her work.

QUESTIONS FOR DISCUSSION

1. Plan a schedule of household tasks for yourself. Are there any tasks that can be omitted?
2. Demonstrate, or discuss, how to sanitize clothes; how to boil clothes.
3. True or false: The typical home of today is cleaner, more healthy than the typical home of a hundred years ago. Qualify your answer.

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Chapter 14

KITCHEN SANITATION

Safe food and clean eating utensils are the result of careful attention to routine kitchen tasks. These include good dishwashing methods, adequate storage of food, and prompt and efficient garbage disposal. Kitchen sanitation measures are important factors in the control of disease and building good health. Unless perishable foods are handled properly, microbes will grow and multiply in the foods. Careless handling of garbage will encourage household pests. (The dangers to health from household pests will be discussed in a following chapter.) Improper washing of dishes can spread, instead of remove, any bacteria or viruses present. Pathogenic microorganisms gain easy access into the body if carried along with food or eating utensils that go in the mouth. The nurse can help most if she suggests common sense, practical measures and avoids sounding like an alarmist. Fastidiousness can be overdone, yet household hygiene deserves more serious consideration than it has received in the past.

Refrigeration of Food

Proper refrigeration is a defense against food spoilage and a boost to the family budget as well as to the family's health. Insurance records[1] reveal that the number of deaths from "food poisonings" began to decline in 1927, when refrigeration of food became generally available. The extent of foodborne illness in America today is not fully known or appreciated. Almost 21,000 cases and nearly 100 deaths from Salmonella were recorded in 1964, figures probably representing gross under-reporting.[2] (Drastic reduction in Salmonella infections may be possible with routine pasteurization of animal feed ingredients and with improved methods of processing meats, poultry, and egg products.)

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[1] Metropolitan Life Insurance Company.

The householder can help to reduce the different kinds of foodborne illnesses. One simple measure is to refrigerate foods at temperatures sufficiently low to prevent bacterial growth. Milk and cream should be stored in a meat-keeper which provides for proper circulation of air, adequate moisture, and a temperature slightly above freezing.

Two general rules to remember are (1) cold foods should be held at all times at a temperature of 4.4°C. (40°F.) or below, and (2) hot foods should be held at a temperature of 64°C. (150°F.) or hotter, except during preparation. This is particularly essential for such potentially hazardous foods as milk and milk products, smoked meats, poultry, and moist combinations of foods. If leftover foods are put in shallow containers for refrigeration (small if possible), the food will chill more quickly than if stored in deep bowls. Formerly, it was necessary to cool foods before refrigeration because the cooling capacity of the ice box was limited. With the improved modern refrigerators food can be stored immediately. Quick cooling of food lessens the chance of bacteria multiplying.

Many common practices tend to decrease the efficiency of refrigerators, raise inside temperatures, and cause food spoilage. Temperature inside a refrigerator may rise if the refrigerator is overloaded, if food items are stored in paper bags, if the refrigerator is defrosted overnight, and if the door is frequently opened.

Periodic cleaning of the refrigerator will prevent growth of mold or bacteria on unclean surfaces, as well as prevent collection of food odors and facilitate the discarding of inedible foods.

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[2] James D. Snyder, "The White House Conference on Health," *Hospital Management* (December 1965), p. 40.

Wash off dusty coke or milk bottles, and store only clean containers in the refrigerator.

Food cannot be stored indefinitely in the refrigerator, and perishable items such as ground meat, fish, poultry, and liver should be used within two days. Shellfish must be used the same day they are purchased. Steaks and chops may be stored from three to five days, and roasts from five to six days. If fresh meat is not to be used within the recommended time, it should be frozen for further storage.

REFRIGERATOR OR FREEZER?

The freezing compartment of a refrigerator is not always a true freezer. The true freezer holds frozen food at −18°C. (0°F.). The frozen food storage compartment of a refrigerator holds food at a higher temperature, usually about 2.8°C. (27°F.). The combination freezer-refrigerator of many recent models maintains the zero temperature needed for proper freezing and storing of foods. Ask the salesman before making a purchase, or read carefully the care-and-use manual which accompanies the appliance. The terms *food storage locker* or *frozen food storage compartment* used in the manual indicate the appliance is a refrigerator, and frozen meats should be stored in it no longer than one week, other frozen foods no longer than two weeks.

FROZEN FOOD STORAGE

Most foods store satisfactorily at −18°C. The temperature of the freezer and the kind of food determine the maximum storage time. Foods cannot be kept indefinitely in a freezer. Table 14–1 gives the recommended storage time and temperature. Quick-frozen foods (frozen at −72°C.) may be kept the maximum time or longer.

For both quality and safety, foods to be frozen at home should be packaged meticuously in moisture-proof wrappings and con-

Table 14–1. *Maximum Storage Times for Frozen Foods*

FOOD	MONTHS AT −18°C. (0°F.)
Beef, fruit juices, berries packed in syrup	12–16
Fruits, vegetables	10–12
Lamb, game birds, eggs	8–10
Lean fish, ham, poultry, veal	6–8
Ground beef, fresh pork, cottage cheese, butter, shellfish, shrimp	4–6
Beef liver, fatty fish, slab bacon, ground pork	2–4
Variety meats, leftover, cooked foods, ice cream	1

tainers. These wrappings include plastic wrap, cellophane, aluminum foil, and laminated freezer paper. Do not use ordinary household waxed paper. Follow directions given for blanching vegetables. Correct packaging and wise selection of high-quality foods will yield best results. Freezing does not improve the quality of food, and not all foods can be frozen satisfactorily. Cream and custard pies, meringue toppings, and hard-cooked egg whites do not freeze well. Fried foods are apt to become rancid after one to two months of storage. Use as little fat as possible in gravies and sauces. Fats have a tendency to separate, but if they are used in small proportions they will recombine when heated.

The wise homemaker labels the frozen food packages as to content, date of freezing, and maximum storage date. Some system of records will be helpful. Many homemakers store similar foods together and place new purchases at the bottom or back of the freezer. This moves foods that have been in freezer storage longer toward the top or front. The length of time to store commercially frozen food is influenced by the temperature at which the packaged foods were held in the store. Table 14–2 shows approximate storage times.

The prudent shopper buys frozen foods from a reputable dealer and selects packages only from clean cabinets in which foods are stacked no higher than the proper fill level. Frozen food items

Table 14–2. *Suggested Maximum Home Storage Periods to Maintain Quality in Commercially Frozen Foods*[*]

FOOD	MONTHS AT −18°C. (0°F.)	FOOD	MONTHS AT −18°C. (0°F.)
Fruits and vegetables		*Poultry*	
Fruits and fruit juices	12	Chicken	
Vegetables	8–10	Cut up	6
		Livers	3
Baked goods		Whole	12
Bread, rolls, pastry	2–3	Duck and goose (whole)	6
Cakes	2–4	Turkey (whole or cut up)	6
Doughnuts	3		
Pies (unbaked)	8	*Cooked chicken or turkey*	
		Dinners	6
Meat		Pies	12
Pork sausage	2	Fried	3
Hamburger	3		
Lamb patties	4	*Fish*	
Beef	12	Fillets	4
Lamb	12	Steaks	2–3
Pork	8	Shellfish	
Veal	8	Clams	3
Cured pork	2	Crabs	2
Veal chops	6	Oysters	1
		Shrimp	4
Cooked meat		Cooked fish	3
Dinners	3		
Meat pie	3	*Frozen desserts*	
Swiss steak	3	Ice cream	1
		Sherbet	1

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[*] From *Home Care of Purchased Frozen Foods* (Home and Garden Bulletin No. 69, U.S. Dept. of Agriculture, 1960).

should be the last foods chosen at the grocery, and they should be protected with an insulated bag or double paper bag for the trip from store to home. The nurse should remember that frozen foods which have thawed should not be refrozen. Illness has been traced to poultry and meats that have been frozen, thawed, refrozen, and then cooked and eaten. Thawed foods deteriorate more quickly than fresh foods, hence cook or use foods immediately upon thawing.

Do not freeze a whole turkey stuffed with dressing. Safe preservation of food requires quick cooling. If the turkey contains stuffing, the length of time required for the center of the turkey to cool is enough time to permit multiplication of bacteria. The staphylococci bacteria produce a toxin which is not destroyed by heat, hence the baked turkey could cause illness. The nurse who understands how bacteria grow and multiply will be able to interpret other situations.

An automatic oven is a convenient feature of many gas and electric stoves. It is designed to enable the homemaker to put a casserole or meat dish in the oven before leaving the house; the timer turns the oven on at a certain time and temperature, and the food is ready for serving when the homemaker returns. The casserole may be in the unheated oven for several hours and in the temperature range suitable for bacterial growth. An experiment was conducted to determine the bacteriological changes which occur in casserole dishes thus held and baked.[3] It was found that thoroughly chilled casseroles may be safely held in electric ovens for four to five hours, but not in automatic gas ovens with a pilot light. Frozen casseroles may be safely left in automatic electric ovens for eight hours, and in an automatic gas oven with a pilot light for a few hours. Freshly prepared warm casseroles should not be left in either gas or electric ovens because the temperature is in the growth range for staphyloccoci during the entire holding period. This practice could lead to food poisoning if strains of staphylococci that produce heat-stable toxin are present.

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[3] Priscilla Huppler *et al.*, "Bacteriological Implications of Holding Casseroles in Automatic Ovens," *Journal of Home Economics* (December 1964), pp. 748–751.

Home Canning

Today few people home-process canned foods, hence less education is directed toward proper methods of canning foods, yet for those who do can foods in their own kitchens, good work techniques are vitally important. Because foodborne illnesses have resulted from eating improperly canned foods, many state health departments prohibit the serving of home-canned foods to the public. At church dinners or state fair booths only commercially canned foods may be served.

Three basic sterilization procedures in canning or processing will cause the death or inactivation of the microscopic food spoilage agents, the bacteria, molds, yeasts, and enzymes. In the open kettle method, the heated, prepared food is poured into sterilized jars and sealed immediately with sterilized lids. No further processing is done. This method should be used only for preserves, jams, butters, pickles, and other foods to which are added enough sugar or vinegar to prevent spoilage. In the boiling water bath, the jars are filled with the prepared food, placed on a rack, covered with water, and boiled for the recommended processing time. This method should be used only for fruits, tomatoes, and other acid foods. Enough heat is supplied, without overcooking, to destroy bacteria, enzymes, and molds which cause spoilage in acid foods. The steam-pressure method employs a pressure cooker that utilizes steam under pressure to raise the temperature above boiling. A temperature of 115°C. (240°F.) is required for nonacid foods in order to destroy spore-forming bacteria such as *Clostridium botulinum.* The steam-pressure method should be used to can beets, corn, meat, chili, and all other low-acid foods. Oven canning has been used satisfactorily for fruits and tomatoes, but is hazardous because of the danger that the glass jars may explode.

If the homemaker decides to process foods in her own kitchen, she should follow carefully the recommended procedures. Reliable information is available from the U.S. Department of Agriculture in various issues of the *Home and Garden Bulletin;* leaflets from the state extension service; and booklets from the manufacturers of jars and containers. These pamphlets are either free or may be obtained for a reasonable price.

OTHER SAFE PRACTICES

Nonacid and low-acid home-canned foods should be boiled at least fifteen minutes before they are eaten. Any home-canned food that has the slightest unpleasant odor should be thrown away. Canning factories maintain a rigid inspection of their canning methods. Homemakers should establish the practice of inspecting all home- and factory-canned products before serving them. In addition to an unusual odor, these are things to look for:

1. Bubbles of gas should never appear in the food.
2. It should require force to pry off the lid. Beware if the lid can be removed easily!
3. The food should be solid and unchanged in color.
4. The ends of a tin can should be flat, not bulged.
5. A jar should not spurt its liquid contents when opened.

Any one characteristic is sufficient warning to throw away the food without tasting it, and it may be wise to boil such foods before putting them into a garbage can, in order to protect animals that might later eat it.

Because of the danger from trichinosis, all pork should be cooked thoroughly before it is eaten.

Wash all fruits and vegetables before using them in salads or eating them raw.

All foods and food-contact surfaces should be protected from accidental contamination with insecticides, rodenticides, or other toxic substances.

To help prevent foodborne illness in the home, everyone who handles food should observe the rules for good personal hygiene.

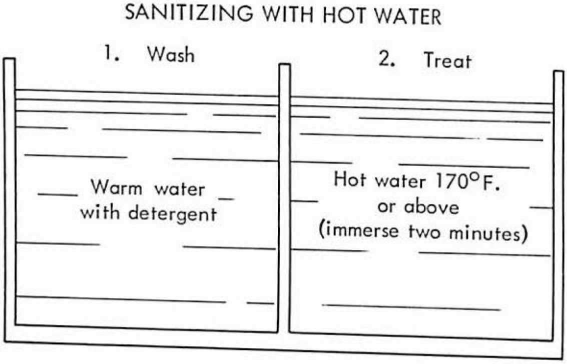
Dishwashing

Both eating and cooking utensils are potential means of transmitting pathogenic and food-spoiling microorganisms. Good dishwashing practices can break this link in the cycle of infection.

To help prevent the spread of disease, dishwashing methods used in public eating places must be approved by the local health authorities. Figure 14–1 demonstrates some techniques for sanitizing dishes based upon recommendations from the U.S. Public Health Service. The nurse occasionally supervises or helps with dishwashing at youth camps, social gatherings, and organization meetings. She should understand that sanitizing with chlorine requires cool, clean water. If the water is too hot, it drives off the chlorine. The practical nurse should know when actual sterilization of dishes is necessary. She should be able to describe good methods for the homemaker to use in daily dishwashing, be able to suggest additional sanitary measures when minor illnesses occur, and know the real value of a mechanical dishwasher.

In cases of disease transmitted by saliva and sputum (for example, diphtheria and tuberculosis), the dishes and eating utensils of the patient should be boiled. Only sterile dishcloths should be used. The details of sterilization must be mastered thoroughly by the nurse, and she should be able to adapt sterilization procedures to home use.

The ordinary home eating area represents a more isolated situation than a public dining room or hospital cafeteria. Unless known contamination exists, the following suggestions are usually adequate for washing dishes: Scrape and rinse dishes and utensils to remove food particles. Use only a clean dishcloth or dishmop. Wash carefully with friction, the spoons, forks, and dishes that touch the mouth. Use soap or other detergent in very hot water. (A water temperature of 46°C. to 49°C., 115°F. to 120°F., is as hot as most persons can stand.) Rinse in equally hot water. Dry with a clean towel or in a dish rack that is in a clean area. Dishes allowed to dry in an unclean area with strong air currents offer


SANITIZING WITH HOT WATER
1. Wash
2. Treat
Warm water with detergent
Hot water 170°F. or above (immerse two minutes)

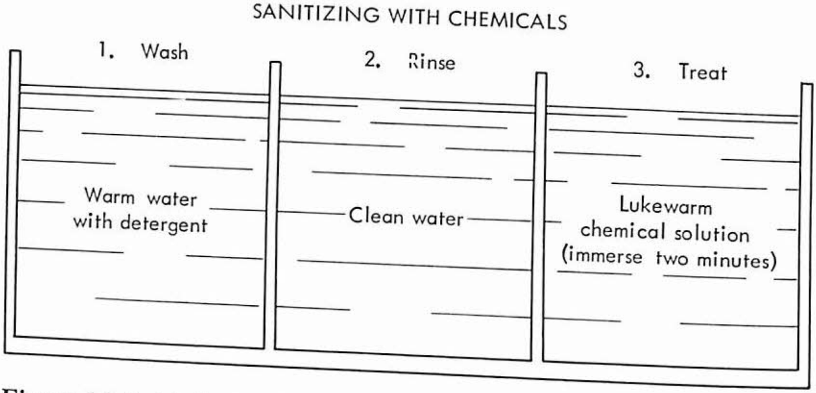

SANITIZING WITH CHEMICALS
1. Wash
2. Rinse
3. Treat
Warm water with detergent
Clean water
Lukewarm chemical solution (immerse two minutes)

Figure 14–1. Methods of sanitizing dishes in public eating places by hand washing. The water in the third sink for the chemical method should contain at least 50 ppm (parts per million) of free chlorine (meaning 50 atoms of chlorine for every million molecules of water) but preferably 100–200 ppm. If the water in the sink is too hot, the heat will drive off the chlorine. (From United States Public Health Service Publication No. 83.)

no advantage over drying with a clean towel. Another good sanitary practice is to launder the dishcloth or dishmop two or three times weekly in water containing disinfectant (usually chlorine). In the event of sickness in the home, the eating utensils may be further sanitized by drying them and placing them in the oven at

71°C. (160°F.), provided, of course, that the dishes are made of a material that will withstand dry heat.

The use of disinfectants in home dishwashing must be approached cautiously. The professionally trained person—a nurse, doctor, or laboratory technician—might safely use disinfectants, such as tablets containing chlorine or iodine, for such a person would understand that the utensils must be adequately rinsed in order to remove all residues. General use of disinfectants in home dishwashing is not recommended, however, because of the danger of leaving toxic material on surfaces that would be used for food.

Because of the increased number of home dishwashers, nurses need to know and be able to explain the correct use of the dishwasher. Many people have the erroneous idea that the dishwasher *sterilizes* dishes. Nurses can help the public to realize that the home type mechanical dishwasher *sanitizes* but does not sterilize dishes.

Usually, machine dishwashing is better than hand methods because wash and rinse waters are hotter than the hands can stand and because the detergent is more highly concentrated. Dishes are dried by a sanitary heat unit eliminating the transfer of bacteria from dishcloths and dishtowels. Families continually report less spread of colds from one member to another after a dishwasher is purchased, but this is difficult to prove scientifically. Microbiology studies have been made to compare handwashing and mechanical dishwashing. With a 60°C. (140°F.) water temperature, a higher percentage of machine-washed utensils rated acceptable than handwashed utensils.[4] Some staphylococci and other gram positive cocci survived the dishwashing at 60°C. (140°F.), but because a large percentage of the utensils were acceptable by public health standards, the dishwashers were credited with *sanitizing* the utensils.

In another study,[5] optimum sanitizing of viral contaminated dishes was obtained with water temperatures of 64°C. (150°F.) and above. However, some viruses were recovered from an occasional dish despite being washed in water at 77°C. (170°F.), or boiling. Adding detergents to both the prerinses and wash cycles helped to reduce the virus count.

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[4] Ethel McNeil *et al.*, "Microbiology of Home Type Mechanical Dishwashing," *Soap and Chemical Specialties* (September, 1965).

[5] Stephen Chapman, "The Removal of Viruses During Dishwashing," paper presented at 84th Annual Meeting of the American Public Health Association, November 12–16, 1956, Atlantic City, N.J.

Because the destruction of microorganisms by heat is dependent on both time and temperature, it is important to note temperatures reached during the washing, rinsing, and drying phases. In mechanical dishwashers without a supplementary booster-heater, the sanitizing temperature of the machine was confined to the drying phase only.[6] If the dishwasher had a supplementary booster-heater, sanitizing temperatures were present in washing, rinsing, and drying phases.

Garbage Disposal

Improperly handled garbage is not only an affront to esthetic values but a health hazard. Disease organisms are likely to flourish and grow on the animals, rodents, and flies that thrive by eating garbage and other wastes. As cities grow and the population increases, garbage handling becomes a more acute problem and requires increased cooperation from the individual householder. In urbanized areas where garbage is properly handled and collected twice weekly, the fly, rodent, and odor problems are substantially reduced.

The garbage is less accessible to flies if it is drained and wrapped in several thicknesses of newspapers before it is placed in the garbage can. (If hog feeding is the local practice for garbage disposal, the garbage should be drained but not wrapped.) Filling the container loosely prevents the contents from sticking or freezing to the insides of the can, reduces any damage the can might receive from rough handling, and makes the container easier to clean.

[6] McNeil, *op. cit.*

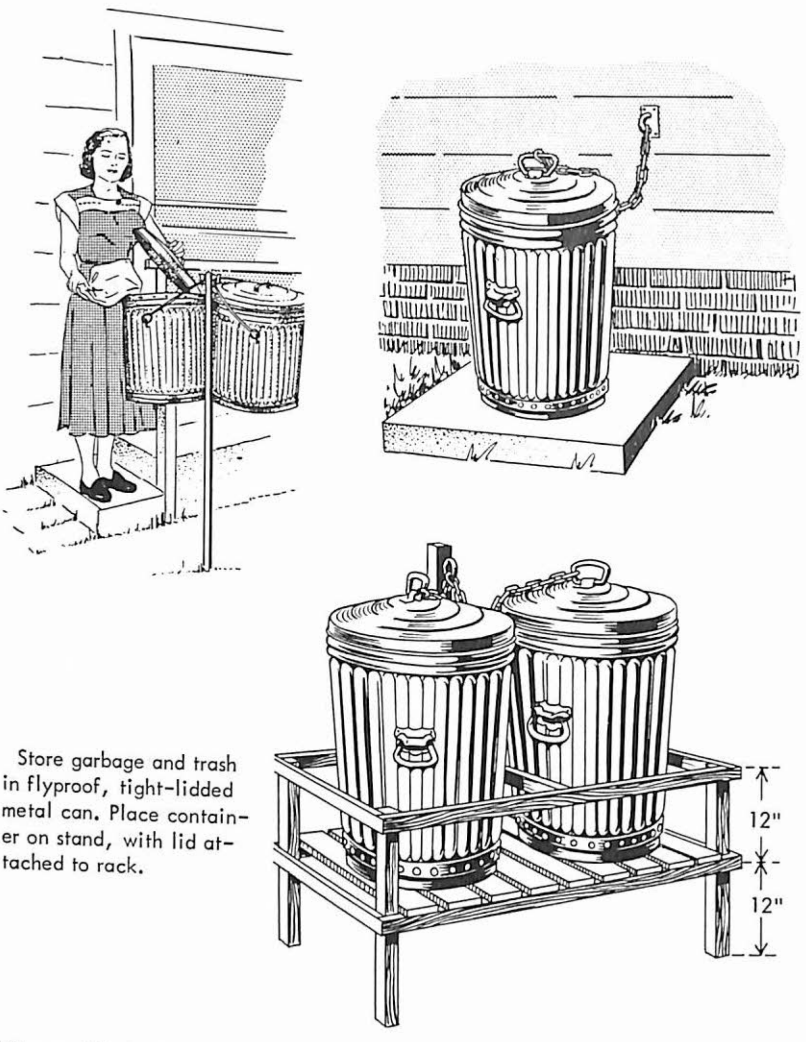
Garbage cans should be watertight; rust resistant; structurally strong, to withstand handling stress; provided with a tight-fitting lid; furnished with side handles or a bail; and easily filled, emptied, and cleaned. The conventional heavy-duty galvanized garbage can with recessed bottom meets these recommendations. Container size should enable one man to handle the filled can. The 5- to 12-gallon container is recommended for garbage only, and the 20- to 32-gallon container for garbage and refuse combined. Some communities limit the combined weight of container and contents to about 65 pounds.

It is important to keep the area clean around the garbage can. Placing the garbage can on a rack or stand will reduce corrosion of the can, discourage dogs from overturning it, and allow the ground underneath to be cleaned, thus eliminating rats. The storage rack with an open, slatted bottom, holding the containers at least 12 inches off the ground, offers better protection than a concrete slab. Health officers have noted that racks and containers are usually better maintained when exposed to the scrutiny of neighbors. (See Figure 14–2.)

The householder's responsibility has not ended when the garbage can has been emptied by the city's refuse collection crew. After curb collections, the householder should return the garbage can to its normal place as soon as possible. The container should be washed and, preferably, emptied into the sewer system. If the washings are emptied on the ground, food scraps may provide rat food and fly-breeding media. The liquid can so saturate the ground that the earth itself contains sufficient nutrients to breed flies. After the can is washed it should be inverted and dried before reusing. During insect seasons it is desirable to spray the can and rack with insecticides.

Home garbage grinders provide quick and convenient disposal of garbage, but other refuse still has to be collected.

Properly installed home incinerators will not cause smoke or odor nuisances and will eliminate the need for home garbage storage and collection.



Store garbage and trash in flyproof, tight-lidded metal can. Place container on stand, with lid attached to rack.

Figure 14–2. Storage of garbage. (From United States Public Health Service Publication No. 772.)

Trash Collection

Accumulated rubbish and trash can present a problem. Householders often find it difficult to dispose of newspapers, magazines, tin cans, yard clippings, wood, glass, bedding, crockery, and other objects. Because much of the rubbish is combustible it constitutes a genuine fire hazard. Large, bulky items, such as cardboard boxes, tree limbs, old furniture, and metal containers are difficult to handle by the collection crews unless properly prepared. Such items should be disassembled and tied in bundles or otherwise reduced to a size and weight that can be handled by one man. Usually bundles should weigh no more than 50 pounds, and length should not exceed 4 feet. Improperly prepared rubbish is often left behind by collection crews. Weekly collection of trash is usually satisfactory, summer and winter.

Collection Outside Urban Areas

Regular refuse collection service is seldom available outside of urbanized areas, therefore each householder must haul his refuse to a public disposal site or dispose of it on his own property. Garbage grinders, household incineration, burial, backyard composting, and feeding to animals are commonly used household disposal methods. Refuse should never be dumped on the ground where it will attract flies and rats, or become a fire hazard.

Householders who cooperate with local health officials and follow community regulations receive many dividends. Such cooperation enhances possibilities for a safe and comfortable home and an attractive, healthy community.

QUESTIONS FOR DISCUSSION

1. Obtain the specific recommendations from your local sanitation department on how to handle garbage and refuse. How often are garbage and trash collected in your community?
2. Contact your state health department for educational materials regarding food handling in public eating places, food storage, and waste disposal.
3. Plan for a class demonstration on the use of a home mechanical dishwasher.
4. May home-canned foods be served to the public in your state?
5. If time permits, define *enzymes* and study their influence on the virulence of microorganisms.
6. Discuss (or possibly demonstrate) methods to sterilize dishes in the home.

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Chapter 15

CONTROL OF HOUSEHOLD PESTS

With increased urbanization the problem of keeping houses free from household pests becomes more acute. The overcrowding of the human population in many sections of cities and towns plus growing areas of substandard housing make the environment more favorable for insects and rodents. Insect and rodent infestation in homes, in businesses, and on farms results mainly from neglect of basic cleanliness. Such conditions usually exist because of lack of knowledge, carelessness, and indifference.

A successful approach to resolving these problems involves public education and promotion of sanitary practices by the individual and the community. Because of its relationship to health, the practical nurse should know about pest control. All vermin should be controlled whether they are disease-producing or merely nuisance varieties.

The practical nurse need not be a walking encyclopedia, with the technical knowledge of an entomologist or sanitarian. But she should know general preventive measures for control of household pests and where to turn for help in serious situations.

The nurse could be one wedge helping the less fortunate one-fifth of our nation's people to share the economic progress enjoyed by the more prosperous four fifths. Cleanliness stems more from the knowledge of how to be clean and the desire to be clean than from money.

Importance of Good Housekeeping

Good general housekeeping is the best protection against household pests, for it is easier to prevent pests from infesting a house than it is to get rid of them after they are established. Systematic housecleaning, the practice of sanitation in and around the house, and the proper use of the right pesticide will enable the homemaker to get rid of household pests, and to keep them out. Household pests seek food and places to hide and breed. Not finding these, the pests will go elsewhere. Well-kept, clean residential areas have less vermin than substandard areas.

The following suggestions will discourage household pests: (1) Store and dispose of all refuse, such as garbage, bits of food, crumbs, scraps of fabrics, lint, and other waste materials, promptly. (2) Keep places clean where pests can breed if they find food—behind kitchen drawers; in seldom-used storage cabinets; around baseboards; in cracks and crevices in cupboards, walls, and floors; and around water pipes and toilets. Scrub these places frequently with hot water and soap or detergent. (3) Store all foods in tightly closed containers and keep the containers clean outside as well as inside. (4) Be careful to prevent carrying in pests. Before buying dry foods, examine the package carefully for breaks and evidences of insect infestation. Promptly dispose of cardboard cartons used to transport groceries. Cockroaches or silverfish are frequently found in the crevices of the cartons. (5) See that doors and windows of the house are properly screened and fit tightly. Close all openings and places where pests may enter. It helps to caulk openings and cracks around wash basins, toilet bowls, water pipes, drain pipes, and radiator pipes. Fill in cracks around baseboards and between floorboards. (6) Outside the house, drain or fill standing water and keep weeds cut. Keep animal shelters clean and wastes picked up. Feces from dogs or other large pets, deposited on the premises, cause odor and fly infestation. Dispose of human wastes in a sanitary manner. Eliminate rubbish and other insect hiding places.

(7) Use of pesticides may be necessary to supplement good housekeeping.

Value of Pesticides

"Pesticides are chemical substances used to kill pests. The pests may be insects, rats and mice, algae, nematodes (worms), and other destructive forms of life. Pesticides that are used only for killing insects are called insecticides. Miticides are used to control mites, and rodenticides to control rodents." [1]

Undoubtedly pesticides have been a factor in the control of diseases such as malaria, yellow fever, typhus, and plague; and in providing our country with an ample food supply of high quality and low cost. Because the pesticides are strong enough to kill pests, they are poisonous and potentially dangerous to humans. Accidental ingestion has been responsible for many deaths. There may be danger for humans in any contact with these chemicals. There may also be adverse results from the long-term effects of the minute amounts of pesticide contamination which remain in the air, water, or food. The indiscriminate use of agricultural chemicals was questioned by the late Rachel Carson in her book *The Silent Spring*. The controversy created has not fully subsided, and some recognized authorities doubt that Miss Carson's questions have been answered satisfactorily.[2] With this in mind, the homemaker must be exceedingly careful when applying pesticides. She must prevent accidental exposure, and use only the exact amount needed, never an extra measure.

[1] *Pesticides,* Public Health Service Publication No. 1081 (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1963).

[2] Dr. Howard W. Mitchell, "Pesticides and Other Agricultural Chemicals As a Public-Health Problem," *American Journal of Public Health* (June 1965), pp. 10–14.

SAFE USE OF PESTICIDES

Read carefully the directions given on the container label, and follow them exactly. Do this each time that you use a pesticide. Heed all precautions stated and note what to do if an accident occurs.

Store pesticides safely in tightly closed, well-labeled containers where children, pets, or irresponsible persons cannot reach them. Do not store pesticides near food, under the sink, in the pantry, or in the medicine cabinet. Always leave pesticides in their original containers with proper labeling. Dispose of used pesticide containers so that there is no possible hazard to humans, animals, or valuable plants.

Study the directions given on the label to determine the right amount of the right pesticide to use. Select the form of pesticide most effective for the situation.

Residual pesticides are available as liquids to be sprayed, dusts to be blown, or creams to be painted onto surfaces where insects are likely to crawl. A thin deposit of the insecticide remains on the surface and, for several weeks or months, will kill insects that crawl over it. Space sprays and aerosols are effective against mosquitoes, houseflies, and other flying insects. It is important to breathe as little as possible of the chemicals that are discharged into the air. Poisoned baits are more hazardous to humans and pets than other forms of pesticides and should be handled with extreme caution, observing all directions.

Be careful not to get pesticides on food, dishes, or cooking utensils. Remove pets and their food and water pans before applying pesticides. Keep children away from application areas. Do not smoke while handling a pesticide. Handle oil-base sprays as though they were flammable.

In using any pesticide avoid prolonged contact with the skin and excessive contamination of clothing. Wash the face and hands with soap and water after using a pesticide. If any pesticide is spilled on skin or clothing, remove the clothing and wash the skin immediately. Wash the clothing thoroughly before wearing it again.

Various Household Pests

Certain household pests are proved disease carriers, whereas others are noted for destruction to household goods or for spoilage of food for human consumption. For example it has never been proved that bedbugs are disease carriers in the United States, but bedbugs are objectionable because they feed on human blood, have an offensive odor, and soil bed linens and mattresses.

Neither house centipedes nor millipedes damage food supplies or household furnishings, and none have poisonous bites; however, their presence is annoying and may be frightening. Many species of spiders that occur in the United States are harmless to humans. The one dangerous species, the black widow spider, inflicts a seriously poisonous bite which can be fatal, and a person bitten by this spider should call a doctor immediately.

Most wasps—or hornets, yellow jackets, mud daubers, and cicada killers—kill destructive insects and are therefore beneficial, but they can inflict serious and sometimes fatal stings. They should be controlled when their nests are in places where the wasps are a hazard to human comfort and safety. If a person having a history of asthma, hayfever, or other allergy is stung by a wasp, he should immediately contact his physician.

Clothes moths and carpet beetles are serious pests of fabrics in the home. They attack clothing and a wide range of household fabrics, including blankets, rugs, carpets, drapes, pillows, hair mattresses, brushes, and upholstery. They cause up to $500 million in damage annually in the United States.

Silverfish and firebrats cause damage in homes by eating foods and other materials that are high in protein, sugar, or starch. They eat cereals, moist wheat flour, any paper on which there is glue or paste, sizing in paper, starch in clothing, and rayon fabrics.

Clover mites sometimes infest homes and they can become a nuisance, but they do not bite people. Humans are bitten by rodent mites, certain food mites, bird mites, and chiggers. Chiggers in the United States are not known to transmit disease, although secondary infections may occur as a result of scratching.

Ants crawl on any food they can reach and spoil it for human consumption. Crickets are usually not household pests, but they may enter homes at dusk during July, August, and September. Crickets chew and damage clothing and other fabrics, particularly if the articles are soiled.

Sometimes bats enter a home and establish roosts in the attic, in a space between the walls, or in an unused part of an upper story. Normally they are harmless, but bats are subject to rabies and have transmitted the disease to humans. Bats are also objectionable because of their noise and the bad odor that emanates from their droppings and urine, and they should be disposed of as soon as possible.

Several kinds of ticks may be found in the yard or other open spaces. The brown dog tick is the only one frequently infesting homes in the United States. This tick is a parasite of dogs. It rarely bites humans, and does not carry human diseases, but its presence in the home is annoying and can make the dog's life very uncomfortable.

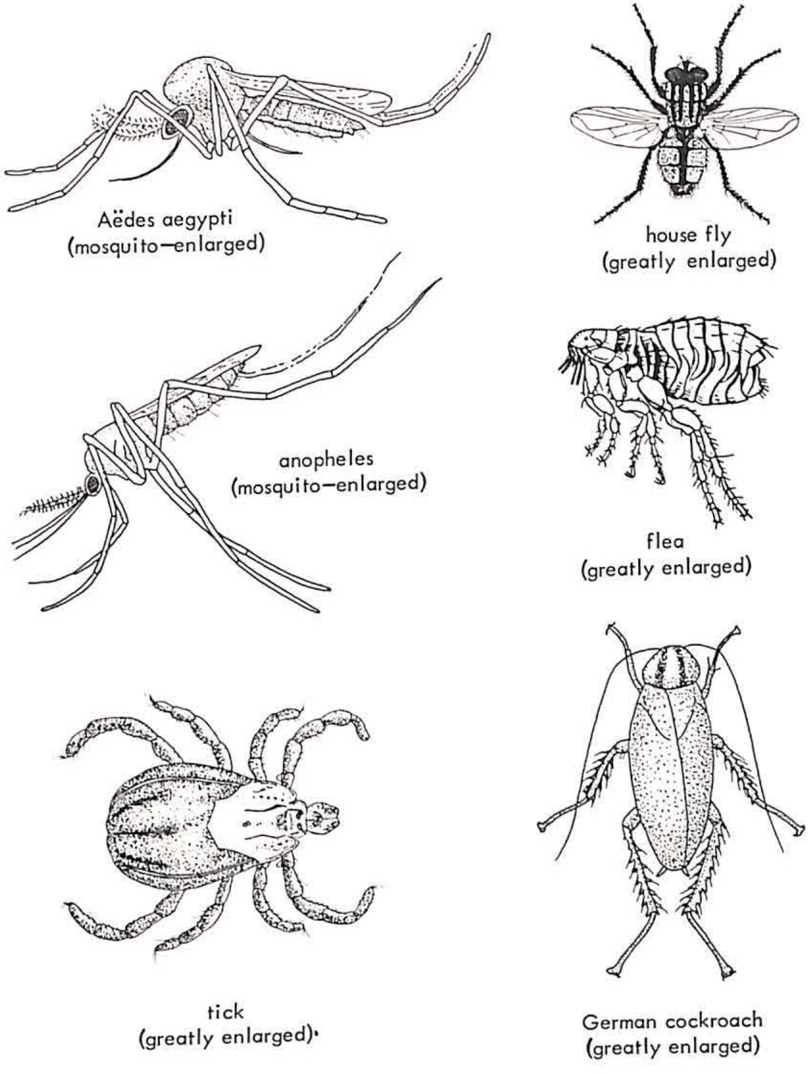
Known Disease Carriers

Although *wood ticks* seldom enter the home, several species can carry serious diseases and people should be alerted to avoid them. Disease carriers include the Rocky Mountain wood tick, found in the western states, the American dog tick, most abundant in coastal areas and the Mississippi Valley, and the lone star tick, most common in the coastal states from North Carolina to Texas.

Wood ticks feed entirely on blood, usually that of animals but sometimes of humans, and their bites are painful. Ticks can carry and transmit Rocky Mountain spotted fever, tularemia, relapsing fever, and a number of other diseases. Ticks infest wooded or brushy areas, uncut grassy fields, parks, and other areas of wild vegetation. They are often found in recreational areas and lawns, and in homes only in small numbers. They are an annoyance and health hazard to farmers, woodsmen, military personnel, campers, hikers, hunters, and vacationers. In areas infested with ticks it is unwise to sleep or sit on the ground. Campers, hikers, and hunters should examine themselves and their clothing twice a day for ticks. Parents should be on the lookout for ticks when children play outdoors in wooded areas. Tick repellents are available to treat clothing, but even with their use, daily inspection is still needed. Figure 15–1 shows the tick and other disease carriers.

Cockroaches occur throughout the United States. Because they carry filth on their legs and bodies, cockroaches spread disease by polluting food. They feed on garbage as well as human food, hence they can transmit diseases caused by food-poisoning organisms. Cockroaches are offensive pests which expel unpleasant, odorous secretions that ruin food. They also eat starch and glue, and thus may damage fabrics, garments, curtains, books, papers, and many other materials. Cockroaches seek warm, moist, dark places to hide during the day and come out at night to hunt food. They develop in large numbers in dirt and filth. Thorough cleaning reduces the likelihood of infestation. Cockroaches may be carried into homes in boxes, egg cartons, beverage cases, and baskets of laundry. In apartments or office buildings they readily migrate from one place to another along water and steam pipes. Good housekeeping and the use of insecticides when necessary are the only means of keeping a home free of cockroaches. Surface sprays or dust are effective to control cockroaches. Because roaches develop resistance to chlorine, dieldrin, and DDT, Diazinon and Malathion are the best choice of insecticide. In heavily infested places professional pest control may be necessary.

The *housefly* is among the filthiest of insect pests. It breeds and feeds in moist organic matter such as manure, garbage, and fruit or vegetable wastes. If disease germs are among these materials, the fly gets them on his hairy legs and feet and in the digestive tract. Flies can contaminate man's food by walking over it and by leaving their excreta on it. By contaminating food and water



Aëdes aegypti
(mosquito—enlarged)

house fly
(greatly enlarged)

anopheles
(mosquito—enlarged)

flea
(greatly enlarged)

tick
(greatly enlarged)

German cockroach
(greatly enlarged)

Figure 15–1. Common carriers of disease.

and by coming in direct contact with the hands and mouth, flies spread dysentery, diarrhea, and typhoid fever. They have a part in spreading cholera, yaws, and trachoma. The tubercle bacilli and the virus of poliomyelitis have been found upon their bodies. For the good health of the family, it is necessary to practice sanitation, eliminate breeding places of flies, screen windows and doors of the house properly, and apply insecticides. Because houseflies have become resistant to DDT and related compounds, other insecticides must be used.

Mosquitoes are found in almost every part of the world. Their bites can cause intense discomfort and their humming disturbs sleep, but more important, mosquitoes can carry several serious diseases: malaria, encephalitis, yellow fever, dengue, and filiariasis. When the mosquito bites and feeds on the blood of animals or people, it can become infected if any disease organisms are present in the blood. Then, if the mosquito bites another person, it passes on the infection. Although community control of mosquitoes requires the knowledge of public health experts and complex, expensive equipment, the householder can do much to protect his family from mosquitoes. He can eliminate breeding places (stagnant water) from the premises, install screens at the doors and windows to keep out mosquitoes, use a residual spray of the right pesticide, and apply repellent to clothing and person.

Fleas, like mosquitoes, feed on the blood of animals and humans; they cannot breed or survive without it. Most species prefer one type of animal—dog or cat—but will attack man if the normal host is not available. Most fleas are objectionable because of their painful, itching bite. Fleas which annoy dogs or cats are generally not disease carriers, but control is important for the comfort of the animals and the people. A house overrun by fleas is almost impossible to live in. Fleas can be controlled by good housekeeping and use of insecticides. Infested rooms should be thoroughly cleaned with a vacuum cleaner and then insecticides appiled. Because fleas have become resistant to DDT, chlordane, or lindane, other compounds are needed.

The *Oriental rat flea* is capable of transmitting both urban plague and murine typhus from the rat reservoir to man. Because of the efforts made to eliminate rats, and the insecticides used to control fleas, plague and murine typhus seldom occur in the United States. Constant vigilance is necessary, however, because plague still exists in small, wild mammals in the western states. There is always the danger that domestic rodents will become infected, and carry the fatal infection to man. Murine typhus is not uncommon among domestic rats throughout the southeastern and Gulf Coast states.

Rats and *mice* transmit over thirty-five known diseases to man and domesticated animals. They spread disease by the parasites they harbor, their excreta, and their bites. They carry eighteen different kinds of ectoparasites, including lice, fleas, ticks, and mites. Hence control of ectoparasites is vital in preventing transfer of rodent diseases to man. In addition to plague and murine typhus, rats can carry leptospirosis (Weil's disease), rat-bite fever, and salmonellosis. Leptospirosis is an infectious disease resulting from direct or indirect contact with the infected urine of rodents. The spirochetes, which are found in water or on food, may enter through mucous membranes or minute cuts or abrasions of the skin. Weil's disease is often found in sailors, miners, sewer workers, and fish or poultry dealers. Rat-bite fever occurs when a rat bites a human and the bacteria on the rat's teeth and gums are transferred to the human. Rickettsialpox is a mild, nonfatal infection transmitted from the house mouse to man by the bite of the mite which the house mouse harbors. Ratborne diseases have killed more humans than all the wars in history. Most of our large cities report 150 or more rat bites annually.

The best way to control rats and mice is to take away the food and shelter that permit them to survive. Traps, poisons, and gases will only temporarily halt a growing rat population. It is man's indifference and carelessness in handling foodstuffs and refuse that has fostered populations of rats and mice close to his home and work. Sanitation and control is a problem for both the community and the individual. Frequently, individual effort is unsuccessful without public control. Efforts of public health workers are also doomed to failure without the support of individual citizens. Proper handling of garbage and refuse by the citizen, as mentioned in the previous chapter, is a crucial factor. (Refuse and garbage handling by the community will be discussed in Chapter 21.) The homeowner should remove uneaten dog or cat food after the pet has finished eating, so that the food will not be available to rats. The practice of throwing bread and other foods outdoors for birds may create a rodent problem. Old furniture, junk, and debris that accumulate in basements, attics, and storerooms should be either removed or stored so as to avoid harboring rats.

Sources of Help

In situations of heavy vermin infestation it may be wisest to obtain the services of a professional pest control operator. The individual then can probably control the pests. The government booklets listed in Table 15–1 contain detailed information. These may be obtained by writing to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., or by inquiry at the office of the county agriculture agent in your area. In some locations, the extension office may employ an entomologist who will advise on special problems. In many states the extension service of the school of agriculture makes available inexpensive, reliable leaflets on pest control. For example, in Indiana the Cooperative Extension Service and the Department of Entomology of Purdue University have released leaflets concerning control of pests such as those listed on the accompanying charts.

Possibly the best and most immediate source of help would be your local health department. Sanitarians can answer your questions and will come to your assistance, especially for community problems.

Table 15–1. *Pest Control Information*

PEST	SUGGESTED TREATMENT	FOR FURTHER INFORMATION
Ants	Indoors: apply 2% chlordane spray or 0.5% dieldrin spray to areas over which ants crawl. Outdoors: dust mounds or nests with 5% chlordane dust or granules, then water in.	Home and Garden Bulletin No. 28, "Ants in the Home and Garden," U.S. Dept. of Agriculture
Bats	Sprinkle roost area with naphthalene or paradichlorobenzene. Batproof home by covering openings with sheet metal or ¼-inch mesh hardware cloth.	Wildlife Leaflet 333, "Control of Bats," U.S. Dept. of Interior
Bees	At night, inject a 5% chlordane dust or a 1% DDVP (dichlorovos) spray into nest opening. After bees have disappeared, close entrance to nest.	Purdue Univ. Coop. Extension Service, Dept. of Entomology, Mimeo E–44
Bedbugs	Spray hiding places with 5% DDT. To control resistant bedbugs, spray with a 0.5% lindane or 1.0% Malathion. 0.2% pyrethrum is effective immediately, but does not last.	Leaflet No. 453, "How to Control Bedbugs," U.S. Dept. of Agriculture
Bran beetles and food pests	Destroy infested cereals and other foods. Clean cabinets and storage spaces, and wash with soap and water. Spray cabinets and shelves with 5% DDT or 0.5% dieldrin. Replace shelf papers. Buy susceptible foods in small quantities. Store in glass or other tight containers.	Purdue Univ. Coop. Extension Service, Dept. of Entomology, Mimeo–37, Mimeo–6

Table 15–1 (*Continued*).

PEST	SUGGESTED TREATMENT	FOR FURTHER INFORMATION
Clothes moths	Spray closets with 5% DDT or 0.5% dieldrin. Use paradichlorobenzene flakes (moth crystals) in closets at rate of 1 pound per 100 cubic feet, or hang a dichlorovos (DDVP) resin strip in each closet. Clean and spray floor, cracks, etc., with 5% DDT or 0.5% dieldrin. Use 10% DDT powder under rugs and pads. Spray carpets around edges with 5% DDT or 0.5% dieldrin.	Home and Garden Bulletin No. 24, "Clothes Moths and Carpet Beetles," U.S. Dept. of Agriculture
Carpet beetles	Control same as for clothes moths except give special attention to spraying 5% DDT or 0.5% dieldrin into floor cracks, beneath quarter rounds, and where lint collects. For quick kill, lindane is effective. Use 1% lindane dust; or spray with 1% lindane obtained by mixing 1 part of 20% concentrate in 19 parts of water.	Home and Garden Bulletin No. 24, "Clothes Moths and Carpet Beetles," U.S. Dept. of Agriculture
Chiggers	Spray lawns and other infested areas in early June with insecticide such as chlordane or lindane. (Mix 4 teaspoons of 20% lindane with 3 gallons water; apply uniformly to 1,000 square feet of lawn.) Insect repellents effective to prevent chigger bites.	Leaflet No. 403, "Chiggers, How to Fight Them," U.S. Dept. of Agriculture
Cockroaches	Spray cracks and crevices where roaches hide with 2% chlordane. To control chlordane-resistant roaches (German roaches) spray with 5% Malathion or 0.5% Diazinon.	Leaflet No. 430, "Cockroaches, How to Control Them," U.S. Dept. of Agriculture

Crickets	Spray basements and infested areas with chlordane. Dilute 1 quart of 45% chlordane concentrate in 6 gallons of water.	Home and Garden Bulletin No. 96, "Controlling Household Pests," U.S. Dept. of Agriculture
Fleas	Dust dogs with 4% Malathion and cats with 1% rotenone. To kill fleas in and around buildings, or in the house, spray with 3% Malathion, or 0.5% Diazinon, or 1% dichlorovos (DDVP).	Leaflet No. 392, "Fleas and How to Control Them," U.S. Dept. of Agriculture
Housefly	Follow sanitary practices and eliminate breeding places. Keep garbage and refuse under cover. On farms, dispose of manure properly. Use screens on house. Inside house: kill flies with aerosols or space sprays, containing pyrethrins or dichlorovos (DDVP). Outside homes: spray with 1.0% ronnel or 0.5% dimethoate or 1.0% Diazinon. Use fly baits.	Leaflet No. 390, "House Fly," U.S. Dept. of Agriculture
Mice	Seal possible entrances into house (holes in walls, floors, foundations). Do not leave food available. If only a few mice enter house, use ordinary traps. For large infestations, use poison bait with care.	PHS Publication No. 563, "Control of Domestic Rats and Mice," U.S. Dept. of HEW, Public Health Service
Mites	Seek to eliminate outdoor breeding places. Indoors: spray or paint insecticide around doors, windows, cracks, or possible entrances. Use 0.5% lindane, or 2% chlordane, or 1–2% Malathion. Insect repellents effective on person and clothing.	Leaflet No. 443, "Clover Mites," U.S. Dept. of Agriculture

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Table 15–1 (*Continued*).

PEST	SUGGESTED TREATMENT	FOR FURTHER INFORMATION
Mosquitoes	Eliminate all stagnant water, such as that which collects in tin cans, old tires, clogged gutters, and downspouts. Spray shrubbery with 2% Malathion. Use mosquito repellents containing Rutgers 612 or diethyl toluamide on body.	Home and Garden Bulletin No. 84, "Controlling Mosquitoes in Your Home and On Your Premises," U.S. Dept. of Agriculture
Rats	Starve rats (never leave out food). Remove shelter by keeping all storage places orderly and clean. Kill with poisoned bait. Keep them out of the house by closing all holes in exterior walls.	PHS Publication No. 563, "Control of Domestic Rats and Mice," U.S. Dept. of HEW, Public Health Service
Scorpions	Inside house: spray chlordane or lindane insecticide on baseboard and around window and door casings. Outside house: spray insecticide on foundation of house, lower parts of tree trunks, stumps, piles of lumber, and rock walls.	Home and Garden Bulletin No. 96, "Controlling Household Pests," U.S. Dept. of Agriculture
Silverfish	Spray books, shelves, closets, around old papers, and areas where silverfish run with 2% chlordane (or 5% DDT or 2% Malathion or 0.5% lindane, or 0.5% dieldrin). Dusts may be used with double concentration of preceding chemicals (dust with 10% of DDT).	Leaflet No. 412, "Silverfish and Firebrats," U.S. Dept. of Agriculture

Slugs	Use methaldehyde baits according to package directions. DDT or chlordane dusts may be used in basements and outdoors on foundation walls, walks, etc.	Farmers' Bulletin No. 1895, "Land Snails and Slugs," U.S. Dept. of Agriculture
Spiders	Spray porches, basements, etc. with 2% chlordane obtained by mixing 1 quart of 45% concentrate in 6 gallons of water.	Home and Garden Bulletin No. 96, "Controlling Household Pests," U.S. Dept. of Agriculture
Termites	Termite control often requires services of a pest control operator. See government publications for descriptions of control techniques. Dept. of Agriculture leaflet 324, "Soil Treatment: An Aid to Termite Control," Farmers' Bulletin 2018, "Control of Nonsubterranean Termites."	Home and Garden Bulletin No. 63, "Subterranean Termites"
Ticks, Brown dog	Treat dog with Malathion solution. (Mix one tablespoon of 50% concentrate with one gallon of water.) Spray insecticide or paint it on cracks in floor, around baseboards and window casings, or places where dog sleeps. Malathion spray may be applied to rugs, carpets, or upholstered furniture. Other insecticides may contain 5% of DDT or 2% chlordane or 1% of lindane.	Leaflet No. 387, "Wood Ticks," U.S. Dept. of Agriculture
Wasps	At night, spray nest with 1–3% dichlorovos (DDVP) or inject dust containing chlordane or DDT or dieldrin into nest opening.	Leaflet No. 365, "Wasps, How to Control Them," U.S. Dept. of Agriculture

QUESTIONS FOR DISCUSSION

1. What specific pests are a problem in your community? Which of these pests transmit diseases and which ones are of the nuisance variety?
2. Why is it dangerous to crush a wood tick on your body?
3. Contact the extension service of your state agricultural college. What publications and services are available regarding pest control?
4. What services are available from your local health department regarding pest control?
5. Arrange for an entomologist from your local health department or county extension office to talk to the class about pest control and the local problems.

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(see also Table 15–1)

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Chapter 16

HOME AND RECREATIONAL SAFETY

Safety is demonstrated by attitude, approach to work, and a way of living. You practice or neglect safety every hour of every day at work, at home, or at play.

Safe procedures are the careful, correct procedures. The best methods for taking temperatures and blood pressures are the safe methods. You observe safety measures when you raise the side rails for the bedfast patient, when you close the safety pins as you change the baby's diaper, and when you mop up liquids spilled on the floor. Practicing safety is an essential part of the life of an alert nurse. Safety habits should transfer to other areas of life, and not be removed with your nurse's cap.

Accident statistics show that workers have more accidents away from work than at work.

Facts About Accidents

More than 50 million people are injured in some degree each year.[1] Nearly one-half of the injured require only medical attention with no restriction on the person's usual activities. One injury in five confines the victim to bed.

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[1] *Accident Facts 1964* (Chicago: National Safety Council), source for all statistics in this chapter.

Accidents are the leading cause of death among all persons aged one to thirty-seven. Among persons of all ages, accidents are the fourth leading cause of death. Motor vehicle accidents take the most lives, followed by home accidents, public accidents (non-motor-vehicle) and occupational accidents. For nonfatal injuries, the greatest number of injuries occur in the home. Let us examine ways to prevent accidents from occurring when at home or participating in sports activities.

AVOIDING FALLS

Falls are the leading cause of home accidents, with a particularly high rate for the group aged sixty-five and over. In almost every instance some condition existed which, when coupled with inattention or carelessness, resulted in an accident. You may help to avert falls by keeping these points in mind (see Figure 16–1):

1. Walk, do not run. Take one step at a time.
2. Hold the handrail when going up and down stairs. Be sure that you can see over anything you are carrying.
3. Keep stairways free of toys, household utensils, and other articles.
4. Have halls and stairways well lighted. Use a light at night.
5. Look where you are going. Think about what you are doing.
6. Remove hazards such as wet or greasy spots on the floor, rubber bands, newspapers, cartons, extension cords.
7. Mend worn places in the rug.
8. Use a stepstool or stepladder to reach a high place, not a chair, table, or drawer.
9. Watch young children carefully. Keep them away from stairways, open windows, and porch railings.

Remove hazardous conditions or stop unsafe practices and you lessen the possibility of an accident.

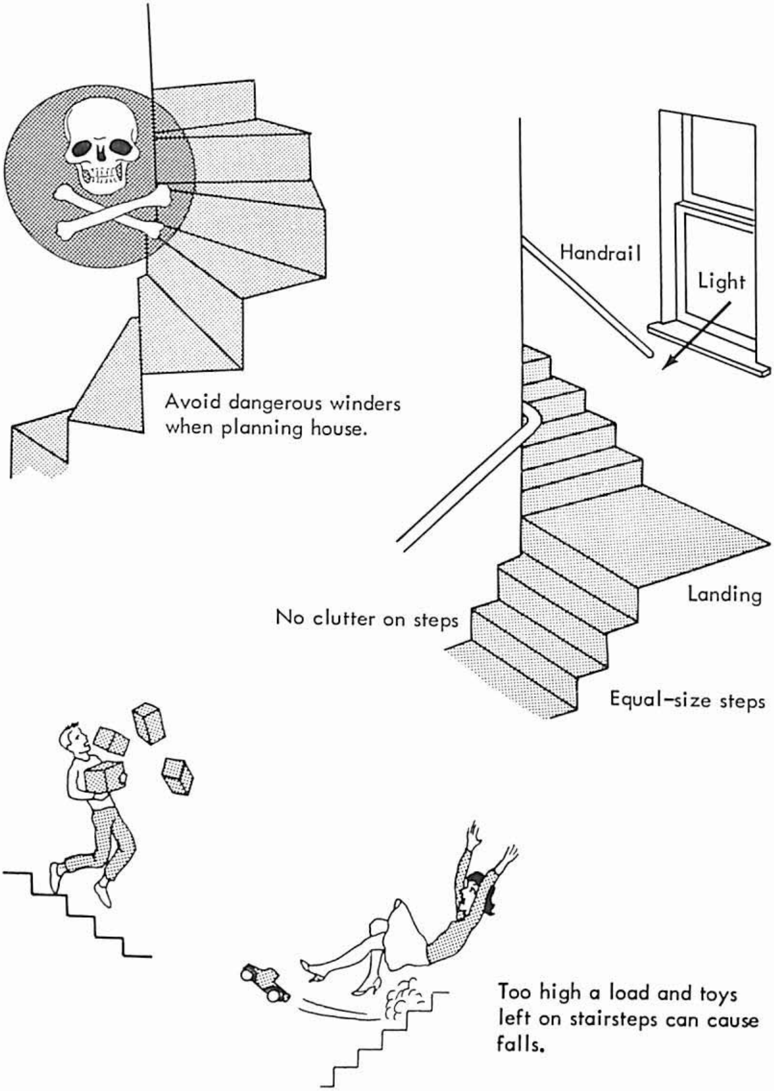
Avoid dangerous winders when planning house.
Handrail
Light
Landing
No clutter on steps
Equal–size steps
Too high a load and toys left on stairsteps can cause falls.

Figure 16–1. Provide safe stairways; use them safely to prevent falls.

FIRE PREVENTION

Fires are the second largest cause of home fatalities, causing one fifth of the total number of home deaths. About one third of all home fire fatalities involve people in the working-age group.

All homes are susceptible to fire, and no economic level is immune. To prevent fires, make your home as free as possible from conditions that may cause fire.

Before a fire can start, some kind of fuel is necessary. In the home this could be paper, grease, cloth, wood, paint, or other combustible materials including rubbish. It is wise to clean out attics, basement, or closets frequently and to dispose regularly of waste and rubbish.

Smoking and matches are the prime fire starters in homes today. Fires may be started by smoking in bed, by dropping cigarettes on furniture or rugs, or by putting lighted cigarettes into wastebaskets. Keep plenty of generous-sized ashtrays in all rooms and store loose matches in closed metal containers. All matches and lighters should be placed where children cannot reach them.

Because heating and cooking equipment are major fire starters, periodic inspection and cleaning are important. Combustible surfaces near stoves, furnaces, and vents should be insulated. Curtains, towels, and other flammable materials should be placed far enough away from the stove so that they cannot ignite. Grease should be removed promptly from the top of the stove and from the oven so that it will not accumulate and catch fire. Fireplaces should be protected by full-fitting screens, and candles used with great care.

Electrical extension cords should be kept in good conditions, and frayed cords or faulty switches promptly repaired or replaced. Home wiring should be kept up-to-date by a qualified electrician, for faulty wiring and overloaded circuits have started many home fires.

Holiday Hazards

People seldom think about safety during the Christmas season or special holidays. Other things are more important. However, hundreds of homes are damaged or destroyed by fire each Christmas season with resulting personal injury and loss of life. To avoid conditions that have resulted in tragedy for others, consider the following.

Choose the Christmas tree carefully, selecting one no larger than you need. A large tree is a greater hazard than a small one, and a dry tree burns more readily than a green one. Buy a tree that has been cut as recently as possible. Keep the tree in water and away from the main part of the house until ready for use. Use a tree-stand that holds water and check the level every day. Make sure that the tree is securely supported and will not tip over. Locate the tree away from fireplace, radiator, or other heat source, and where it will not block the doorway or stairway. Discard the tree when needles start to fall.

Strings of tree lights should not be used on metal trees. Be certain that all lights and electrical decorations bear the Underwriters' Laboratories seal of approval. Check for frayed wires and loose connections before putting lights into use. Never use more than a 15-ampere fuse and do not overload fuses. Use an electrical outlet away from the tree and do not plug and unplug lights under the tree. Turn off all lighting when you leave the house or retire for the night.

Never use open-flame candles on any type of tree. Avoid smoking close to the tree and near gifts or wrappings. Dispose of wrappings promptly after gifts are opened, but do not burn them in the fireplace. Use noncombustible decorating materials whenever possible. Because cotton batting, paper, and flimsy materials ignite easily and burn intensely, they should not be used for decorations or costumes. If loosely woven costumes must be worn, they may be treated with a flameproof solution. Mix 9 ounces of borax and 4 ounces of boric acid in a gallon of hot water. Dip the fabric in this solution, wring by hand and hang of broken glass, china, and tin cans (not in regular wastebasket that someone may reach into).

To avoid accidents caused by electricity purchase only appliances and cords that have been approved by Underwriters' Laboratories; read instructions for new appliances before using them; locate appliances or electric stove far enough away from the sink to avoid the danger of touching them with wet hands or with one hand on the faucet.

To avoid accidents caused by gas keep the gas range in good condition, properly adjusted, unclogged, and free from rust; do not let liquids boil over and put out the flame; make certain the burner ignites when you turn it on; hold lighted match to burners before turning on gas if they do not light from pilot light; call the gas company at once if you suspect a leak.

SAFETY IN THE BATHROOM

Many accidents can occur in the bathroom despite the small size of the room and the relatively little time spent there. Unsafe conditions can be corrected, but to a great extent preventing accidents in the bathroom depends on the daily habits of the whole family.

A fall in the bathroom is likely to prove serious because the person is almost sure to strike a hard surface, such as the tub, radiator, or tiled floor. Most bathroom falls are caused by slipping in the tub or on the wet floor. To prevent falls use a suction-type rubber mat in shower or tub and a nonslip bathmat in front of the tub; provide a firm handgrip to use when getting in and out of the tub; use soap dishes at bowl, tub, or shower so that no one slips on a bar of soap left in the tub or dropped on the floor; and hang wet clothes so that they will drip into the tub instead of on the floor.

Burns or scalds from hot water are very painful and can be severe enough to cause death if a large area of the body is burned. To avoid burns always test the temperature of water in a bowl or tub, especially before bathing children; never leave a small child alone in the tub; and do not permit small children to turn faucets in either bowl or tub.

Cuts are usually due to razor blades, and sometimes other sharp instruments. To avoid cuts keep unused razor blades, scissors, and other sharp instruments in a container especially designated for this purpose, out of the reach of children; place used blades in a closed container with slot just big enough for blades; keep this container where children cannot get it.

The possibility of poisoning may be a serious hazard in a home where there are children unless parents make a particular effort to take proper care of medicines, cosmetics, and other personal or household supplies. If everyone in the family is trained to carry out simple precautions until they become fixed habits, there will be little danger of poisoning. To avoid poisoning check regularly to see that all items in the medicine closet are properly labeled; always turn on a light at night to see what you are using; never use a medicine prescribed for another person; promptly dispose of prescribed medicines that have served their purpose; triple check every medicine by reading the label before pouring the medicine, when giving or taking the medicine, and before returning the bottle to the closet; keep everything locked out of children's reach that might be poisonous if taken internally (this applies to cosmetics, cleaners, and the like).

Water and electricity can be a deadly combination. Anyone who overlooks this fact by touching electrical fixtures or appliances while standing on a wet floor or with wet hands runs the risk of death from electric shock. To avoid electric shock do not use electrical appliances in the bathroom (this does not apply to electric razors, which are specially designed); install light chains having an insulated link near the socket or a cord at the end; teach all members of the family never to touch an electric switch with wet hands, while touching a faucet, or while standing in the tub (when possible, the bathroom switch should be installed out of reach of the washbowl, even outside the bathroom door).

Home Basement Safety

Accidents and fires in the basement do not just happen—they are caused, as are all accidents, by unsafe conditions, unsafe acts, or a combination of both. To make your home a safer place in which to live, correct unsafe conditions and then train family members to avoid unsafe acts. Safety can be achieved only when family members overcome such habits as running down the stairs, standing on boxes or piles of newspapers to reach a shelf, or storing articles on stairways.

Safe conditions include well-lighted stairs and basement; sturdy stair treads; nosing of lowest step painted white; handrail for the entire length of the stairs; prompt removal of nails, sharp edges, or splintered woodwork; floor even and in good repair; and washer, dryer, and ironer connected to a protective ground.

Encourage family members to form safe habits: do not leave articles on the stairway; store paints, varnishes, shellacs, and thinners away from furnace or hot water heater; do not store gasoline or other highly flammable liquids in the basement; throw out oily rags immediately after use; prohibit home dry cleaning; place trash in metal container with tight-fitting cover; keep basement free from discarded items; tie newspapers in bundles and dispose of them regularly; maintain general good housekeeping.

The Home Workshop

The home workshop, often located in the basement, merits special consideration. Many home hobbyists and amateur repairmen have been seriously injured by improper use of tools. Safety starts with knowing the proper use of each tool, and taking time to learn proper control. Using a circular saw, a jointer, or drill press requires manual dexterity which can be gained only through experience. Experienced workmen report that it is usually more practical and safer to buy one good piece of equipment than two cheap and poorly constructed units.

Power machinery and some hand tools should be kept locked away or inaccessible to children or inexperienced persons. The power switch for the home workshop should also be inaccessible to children. It is better to leave the power switch locked in "off" position when not in use.

The home workshop should not be used as a neighborhood club. Strict attention to the work is necessary to operate power-driven machinery. It should also be obvious that alcohol and power-driven machinery do not mix any better than do alcohol and gasoline.

Contrary to popular belief, hand tools may also cause accidents. It is not so much poor technique as improperly conditioned hand tools that result in accidents. Keep hammerheads securely fastened to the handles. Many a skull has been injured by a flying hammerhead. Handles should be in good repair and free from splinters. Keep striking or impact tools such as chisels, punches, and stakes free of mushroomed or spalled heads. Many an eye has been lost as a result of a flying chip from the head end of an impact tool.

Careful directions and instructions are needed for safe use of the following power tools: electric hand drill, abrasive wheels, band saw, circular saw, jointer, wood shaper, wood-turning lathe, and drill press. This knowledge may be gained in a variety of ways. Sometimes a group of beginners get together and obtain the services of a professional woodworker to teach them correct procedures. Occasionally, an instructor from the manual training class of the local high school will be available for group instruction. Many high schools conduct evening classes for instruction in the use of power-driven machinery. In addition, much material has been written on the subject, some by manufacturers of well-known lines of equipment.

Hobbyists who enjoy woodworking find great satisfaction in doing good work and safe work. The best method is the safest method. Remember to proceed with caution while gaining experience. Buy the best machines, and operate them with care. Study characteristics of the materials, determine limitations, and outline safe methods of handling.

Power Lawn Mowers

Power lawn mowers are wonderful time and energy savers if used correctly, but they can shorten hands, feet, even one's life if not handled with respect. To minimize the hazards involved in their use and to provide greater safety for operator and bystanders, the following are advised: for self-protection wear long, heavy denim trousers, safety shoes, and glasses. Clear the area to be cut of all rocks, stones, and so forth. (A rock can be thrown by the blades of a rotary motor at a velocity of 120 miles per hour.) Exclude spectators while the lawn is being mowed, for the operator is better protected than bystanders. Never allow children or early teen-agers to operate or play near a power mower. Give older teen-agers careful instructions before they operate the mower. Learn how to disengage clutch or stop the mower quickly in case of emergency. Stop motor whenever you leave the mower and before moving from one level to another. Cut hills and banks crosswise instead of up and down. Mow only in daylight when the grass is dry. Store fuel in approved safety cans. Allow mower to cool before storing. Learn the special techniques for operating and caring for each type of power mower.

RECREATIONAL SAFETY

Recreation, sports, and holiday activities should boost an individual's physical and mental health, but carelessness and neglect can lead to an accident and needless tragedy. Adults can lessen the possibilities of accident if they observe safety measures themselves, and if they teach their children to do the same. (See Figure 16–2.)

Bicycle safety is important for both the child and adult cyclist. The rider should give hand signals to indicate a turn; ride close to the right-hand edge of the street or highway; always ride single file; obey all traffic regulations; keep a sharp lookout for cars pulling out of parking places; keep the brakes in good working

DRIVE CAREFULLY Anywhere..... All the Time

1. Observe speed limits and highway signs.
2. Drive a safe car. Check brakes, tires, motor.
3. Drive defensively and courteously. Think for the other driver.
4. Drive no more than 8 hours per day, including rest stops every 2 hours or 100 miles.
5. Take special precautions when hauling boat or trailer, or with luggage strapped on top of car. Slow down.

7 Tips for Winter Driving

1. Be able to see and be seen. Remove snow and ice from windshield, lights, reflectors.
2. Check that tires on car have good, deep tread.
3. Get feel of road. Try brakes, depress accelerator to see how slippery road is. Adjust speed accordingly.
4. Stretch your following distance.
5. Brake before entering curves.
6. Pump your brakes.
7. Use proper lights.

Figure 16–2. Vacation trips require safe driving. (Poster from National Safety Council. "Seven Tips" from *National Safety News*, October 1965. By permission of National Safety Council.)

condition. A bicycle in safe condition means safer riding. The safe rider does not weave in and out of traffic or perform "stunt" riding; he avoids crowded streets and highways; he does not hitch a ride on cars or trucks; he never takes along another rider.

Winter sports are fun, but many serious, tragic accidents occur to coasters, skaters, and skiers of all ages. To observe the safety rules of each sport will help to take the hazard out of these popular wintertime activities. The following are only a few of the essential precautions.

Before coasting be sure that the sled or toboggan is in good condition. Select with care the place to coast—avoid coasting on paths that lead to a highway or pond or that have obstacles such as fences or rocks. Keep to the right when coasting downhill or walking uphill. Do not overload the sled or toboggan. Do not steer toward others, and watch out for pedestrians.

When ice-skating, carry your skates in a protective covering or under your arm to avoid being cut by the blades. Do not skate unless someone else is along. Be careful where you skate, and note the condition of the ice. It is best to skate in officially approved areas. If you are a beginner, stay in the center of the rink and out of the way of the experienced skaters. Find out what you should do if you or a companion breaks through the ice.

Skiing accidents are mainly caused by too much speed, but lack of attention, fatigue, faulty trails, and unfavorable weather conditions may also cause trouble. Use only approved equipment with adequate bindings, and keep equipment in good repair. Wear protective clothing. Do not ski unless someone else is along. Learn how to stop and how to turn before starting down even a simple open slope. For open slope skiing, choose only areas that are free from obstacles. On a ski trail observe the rules of the trail. Do not expect others to get out of your way; ski under control so that you can avoid them.

Observe the rules of the sports and you will derive the most pleasure and the maximum benefit.

Safe Swimming and Boating

Swimming is one of the most healthful and beneficial of all sports, but it can also be dangerous. However, most drowning accidents are the result of carelessness in the water, often only a few yards from shore. Adults and children should learn the basic rules for water safety.

Learn to swim well, and teach children to swim as soon as they start going into the water. Learn what to do if you get in trouble, how to tread water and to float. Choose a safe place to swim, preferably a location that is supervised by a qualified lifeguard. Before diving, be sure that the water is deep and free from hidden obstacles. Avoid swimming in the dark. Do not go swimming immediately after eating or if you are overtired or overheated. Get out of the water if you begin to feel tired or cold, for cold or tired muscles are more apt to develop cramps. Take it easy at the beginning of the season; work yourself gradually back into condition before you try to duplicate last year's accomplishments. Know your limitations and do not be a show-off. Have someone accompany you in a boat if you wish to set a record for distance.

The recent increase in the number of home swimming pools in the United States presents new problems. The owners have the right and responsibility to supervise all activities in or near the pool; to insist that no one swims in the pool alone unless someone else is nearby; and to define the shallow and deep sections of the pool. Later, we will consider how to keep the pool clean.

More people than ever are taking to the water in small craft. Boating is a good pastime if you know what you are doing. Most people have a wholesome respect for a body of water while on land, but forget about precautions when they are afloat. It is always easier to avoid an accident than to accomplish a rescue, so keep the boat in good condition and check regularly for leaks or other defects. Never overload the boat. Be sure that all passengers wear shoes with nonskid soles. Insist on good conduct. Call off the trip if the wind is too strong or the weather seems "squally." If you are out on the water and a storm appears to be coming up, head for shore immediately. Train children who are old enough to handle the boat themselves, but be very sure that they really know how to handle the boat before letting them go out alone. Permit children to use the boat only during the day. With a motor boat, check the fuel supply and keep away matches and cigarettes at all times. Take along any standard accessories that may be needed, such as flashlight, spark plugs, and oars.

Firearm Safety

Approximately 2,200 people are killed and 20,000 injured each year in firearm accidents. Roughly half of these deaths occur in and around the home; half of those killed are in the working-age group. According to statistics accidental discharges resulting from carelessness in handling and storing firearms are responsible for more fatalities than is hunting. Unfortunately, many of these accidents do not affect the gunner himself; an innocent person is the victim of his carelessness.

Anyone who handles firearms should remember that a gun is a potential hazard when it is loaded, and the ability to handle it safely is as important as the ability to be a good shot.

The following are a few of the many precautions for the safe use of firearms. Treat every gun as if it were loaded. Be sure that you know where the safety device is and how it works. Use the proper shells. Always load your own gun, keeping track of the number of shells loaded and fired. Keep the gun in good condition. Clean it when alone. Be certain that the gun is unloaded when it is brought into the house. Store firearms and ammunition in separate places, preferably in locked closets where children and careless adults cannot find them.

Anyone who teaches another person to handle firearms should remember that he has the serious responsibility of teaching him to handle them safely. A person who wants to learn to shoot should be given thorough instruction on a protected range by a competent, experienced person. Backyard target practice should never be attempted.

Many gun clubs are organized which will provide instruction and demonstrations on firearm safety. Leaders emphasize that safe hunting and sportmanship go together.

QUESTIONS FOR DISCUSSION

1. What can adults do to prevent accidents to children and to help children develop sensible attitudes toward safety?
2. Make a safety check of your home and discuss needed improvements.
3. Describe someone you know or have read about who is accident-prone. Can you explain why he has so many accidents?
4. Many hospital patients are accident victims. Describe cases that you have known about and how the accidents occurred.

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Insurance companies, their health and safety divisions, print and distribute numerous pamphlets regarding safety. For example, Liberty Mutual has a complete set of leaflets that are available for their policyholders.

National Safety Council. Numerous pamphlets.

PART IV

Community Health and Hygiene

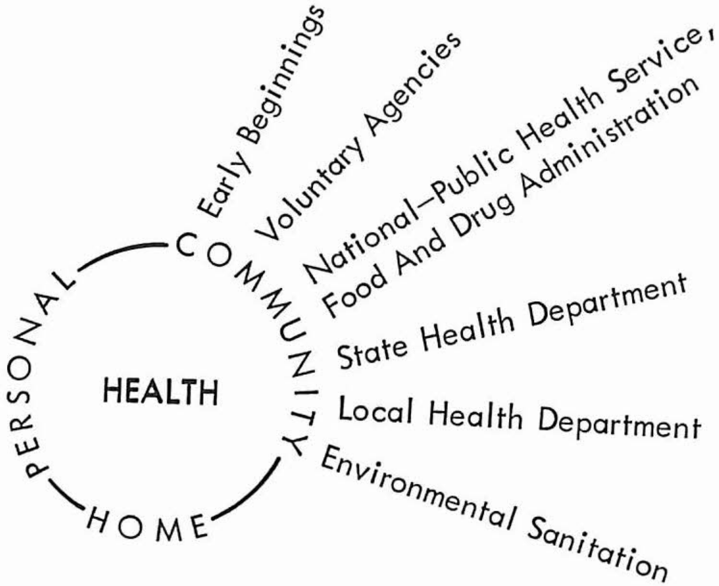

Figure 17–1. Aspects of community health.

Chapter 17

BEGINNINGS OF COMMUNITY HEALTH

From the beginning, early primitive man sought to establish rules which were a form of community health. The early American Indians were practicing sanitary engineering when they took drinking water from brooks on the upstream side of camp and disposed of body wastes on the downstream side of camp. In some areas people with certain diseases were left alone to die—a ruthless way of practicing communicable disease control. A brief examination of the sanitary practices of earlier civilizations will help you, the student nurse, to appreciate more fully public health practices today.

The *Egyptians* who settled along the Nile River advanced their civilization more rapidly than other peoples. By 1000 B.C., the Egyptians had organized and established the profession of medicine. Scrolls have been found which contain descriptions and classifications of diseases. Treatment methods included diets, drugs, physiotherapy, and surgery. The ritual of appealing to the gods was considered important to the "cure." The Egyptians were interested in personal cleanliness. They had public drains and earth closets.

The *Hebrews* are credited with making great advances in the practice of hygiene, sanitation, and prevention of disease, much of which was probably learned during the 400 years of captivity in Egypt.

Moses is known as a "great sanitarian" as well as the law-giver.

The law of Moses, the first personal sanitary code, served to protect the health of the two million Hebrews as Moses led them from Egypt to Palestine, the Promised Land. Verses in the Bible chapters of Leviticus and Deuteronomy describe the code of Moses. The code provided for the inspection of food, slaughtering of animals for food, regulation of diet, maternal health, diagnosis and reporting of communicable disease, isolation, fumigation, and quarantine. Disease had been caused by eating pork, hence a law was formulated to prohibit eating the flesh of swine. Directions were given for the disposal of excreta and refuse, for the disinfection of houses after illness, and for the isolation of lepers.

Leprosy of Biblical times was evidently much more serious and contagious than leprosy today. Because lepers were treated with shame and scorn, the disease was less common than it might have been. The Bible depicts how the lepers received no care and were left to fend for themselves, but the cruel treatment helped to prevent the spread of the disease and doubtless saved lives.

Religion was the greatest contribution of the Hebrews to the betterment of the world. The Hebrew religion emphasized the brotherhood of man. Charity was inseparable from justice and righteousness. Responsibility to God included active responsibility for the welfare of the community. The system of tithing practiced by the Christians meant that a person gave one tenth of his income to the church for its support and for help to the poor. The early Christians led a communal life in which pride of ownership was unthinkable and mutual assistance was as natural as breathing. The Christian religion has proved to be a power that has changed the course of civilization.

The *Greek civilization* was noted for its "Birth of Reason," the days of Aristotle, Socrates, Plato, and Hippocrates. Hippocrates established the practice of medicine as a science, as well as an art. He studied the patient, observed the symptoms, and from these conditions attempted to find the cause of, and remedy for, the disease. Scientific principles replaced superstition in medicine. Hippocrates is known as "the father of modern medicine." He formulated high standards of ethical conduct as expressed in the Hippocratic oath, a portion of which is used today. It is the basis of the Nightingale pledge, often mistakenly credited to Florence Nightingale.

The beautiful Greek countryside influenced its people, who sought beauty and perfection in health as well as in the temples they built. The emphasis was upon exercise, personal hygiene, and diet. They ignored the crippled, the weak, and the ill.

The *Roman period* is remembered for its sanitary engineering, the paved streets, the sewers and drains, and the great aqueducts which brought pure drinking water into the city. The bath was first taken for the sake of cleanliness, then became a cult among the Romans. Private and public bathhouses took on the character of clubs. At the height of the Roman civilization a census was taken regularly. The Romans appreciated hygiene as the foundation of fighting strength. Roman hospitals and medicine were developed to support the army and give good care to the Roman soldier.

Despite what seemed to be a high degree of community and individual cleanliness, the city was victimized by frequent epidemics of disease. Rome introduced the tenement house, and overcrowding resulted. Only an alleyway separated the tall buildings, and the habit of throwing rubbish into the street was the established system of refuse disposal. Sanitary ideals did not prevent Romans from leaving their dead paupers and slaves unburied; the bodies were thrown into open pits. The marshes surrounding the city fostered the malaria which led to the ultimate downfall of Rome.

The *rise of Christianity* continued despite the persecution of the early Christians. The misery of the Christians only intensified the virtues of piety, gentleness, and charity which they upheld. Suddenly, after the worst of many persecutions, the Roman empire under Constantine the Great adopted Christianity as the official religion (about A.D. 324). Christianity appealed for kindliness and brotherly love, advocated charity, and dignified human life and labor, yet certain facets of the Christian religion slowed medical progress. The ideal life was viewed as one of soltitude and contemplation. Suffering was considered the will of God, and by suffering, man won the promise of life after death. The body was frequently abused and cleanliness, diet, and sanitation were disregarded. It was believed immoral to see one's own body. Those who questioned the accepted facts or practices were persecuted.

The invasion of barbarians from the north and east finally resulted in the downfall of Rome in A.D. 476. During the next 500 years, the Dark Ages, the people banded together for protection. The monastery and church people sheltered the remnants of culture and tried to teach the ignorant invaders. The *medieval period*, A.D. 1000 to 1500, is noted for fluid population, hasty development of cities, and uncontrollable communicable disease. There were no effective public health measures at this time and sanitation was uniformly bad. With industrial changes, people crowded into the cities and lived under conditions of indescribable filth. Refuse and body wastes accumulated; slops were usually emptied out of windows; houses lacked ventilation, heat, and any facility for cleanliness. Personal hygiene was neglected. Rich or poor, people were unconcerned about body lice or rats. The poor people often starved to death. Malnutrition increased the seriousness of disease. Spices were used to attempt to make the poor food more edible.

Travel, war, and trade with foreign lands brought people into contact with new diseases for which they had no immunity, thus, communicable diseases spread and few escaped when a disease appeared in a community. Epidemics were frequent and occasionally reached the pandemic stage.

The Moslems made pilgrimages to the birthplace of Mohammed and brought back cholera to the homelands. During the Crusades Christians from as far west as England visited the Holy Land. They spread disease as they went and returned. It is not surprising that leprosy, syphilis, cholera, and bubonic plague spread. In the years 1348 and 1349, a terrible epidemic of bubonic plague, the "Black Death," killed one fourth of the population of Europe, an estimated 25 million people.

Other diseases which were endemic included smallpox, typhus fever, influenza, typhoid fever, diphtheria, dysentery, and cholera. It is difficult for us to comprehend the death toll from epidemics of communicable diseases during these years.

The *Renaissance*, from about 1450 to 1650, marked the rebirth of learning and great creativity in literature and art. Superstition and quackery were replaced by serious efforts to learn the truth. As with Hippocrates and the ancient Greeks, truth was discovered by applying reason and logical thinking to careful observations of nature and of man. Thus was established the basis for the rapid expansion of knowledge which is continuing today.

The *Industrial Revolution* in England during the eighteenth and nineteenth century upset long-accustomed modes of life by changing modes of work. Profit-making became such a strong incentive that human life was sacrified to increase profits. Because mass production required workers to live close to the factory, men and their families moved to the cities, where most of them lived in misery and filth. Not only did adults work long hours, but children from the ages of five to six worked under the same miserable conditions.

The *birth of the public health movement* was due to two major tendencies which were dominant in eighteenth-century Europe: the development of the scientific spirit and the growth of a new motive of humanitarianism, both new ideas in the history of the human race.

The eighteenth century has been described as the scientific Renaissance. The foundations of modern science were laid by such men as Priestley and Lavoisier in chemistry; Franklin in physics; Hutton in geology; Spallanzani in biology; Haller and the Hunters in anatomy; and the Bernoullis, Lagrange, and the Herschels in mathematics and astronomy.

Substantial and concrete advances were made in the field of public health. In 1720 Dr. Richard Mead's book on pestilent contagion and methods of prevention went through seven editions. Sir Christoper Wren's attempt to ventilate the British House of Commons called attention to the problems of air-conditioning. Sir George Baker made an admirable study of causative factors in disease when he demonstrated that "Devonshire colic" was simply plumbism, caused by drinking cider made and stored in lead containers. The subject of personal hygiene was considered more important after Captain Cook's three-year sea voyage in which he lost only one man of a crew of 118. Not one had scurvy. After this, the British sailors were called "limeys" because a supply of limes was taken on each voyage. Vitamin C had not been identified, but it was noted that the sailors who ate limes did not become ill with scurvy.

The medical history of the century was climaxed when Edward Jenner announced in 1798 that he had discovered a vaccination for smallpox. It is difficult for us today to realize the ravages caused by smallpox. In the circle of William the Third, his father and mother died of smallpox, as did his wife Mary, his uncle, the Duke of Gloucester, and two of his cousins; he himself barely survived an attack. In the years 1799 to 1801, over 3,000 persons were first vaccinated and then inoculated with true smallpox, with complete protection in every instance. Few single procedures have proved to be a greater boon to the human race.

To the public health movement, the development of the humanitarian spirit in the eighteenth century was a factor as important as the progress of scientific discoveries.

While the fires of French liberalism flamed out in the French Revolution and Voltaire's pen carried the revolution to the entire continent of Europe, England remained immune against excesses. Yet the seeds were sprouting. The British people found expression in other ways. The preaching of the Wesley brothers contributed to the emotional development of the people. The Wesleys took religion to the factories. The workingman felt himself important. He had a reason to live. John Wesley also wrote a medical book, *Primitive Physick*, containing an excellent set of personal hygiene rules. He distributed his book to the people, and was in reality a medical missionary.

The humanitarian movement had a direct and immediate influence on public health through the prison reforms led by John Howard. Howard traveled through England and Europe, visiting prisons and recording what he saw, and he presented his findings to the House of Commons in 1774. His recommendations were mild, but he introduced into the minds of the British public the fundamental concept of sanitation.

The second part of the great humanitarian movement for public health was the campaign for the protection of the industrial workers of England. The apprentice slavery system met the demands for labor, but under revolting conditions. Pauper children worked sixteen hours a day, often chained to prevent escape. The houses in which they lived were hotbeds of contagion and fever. In 1802 the passage of the British Factory Act limited working hours to twelve and abolished night work for children. Lord Ashley took up the cause and secured the passage of the "Ten Hours Bill" of 1847. These were seemingly unimpressive measures, yet they served to establish the principle of the right and duty of the state to interfere under certain conditions between employer and employee. Today we have many laws protecting the health and welfare of factory workers.

The third and most significant of the socio-sanitary movements of the early nineteenth century was the campaign of Sir Edwin Chadwick and Sir John Simon, the movement known as "the great sanitary awakening." These two men are called the "fathers of the modern public health campaign." Chadwick believed that poverty and disease were related and could be altered. His famous report on the "Sanitary Condition of the Labouring Population of Great Britain" was published in 1842 and resulted in the appointment of a General Board of Health. John Simon was appointed the first medical officer for the city of London, then medical officer to the General Board of Health. Simon's activities between 1855 and 1876 resulted in the passage of a series of laws, of which the Great Sanitary Act of 1866 is the most notable.

A contemporary worker in the health field was Florence Nightingale, who returned from the Crimean War in 1856 to find herself a heroine to the British people. Miss Nightingale was an acknowledged authority on all health measures, including public health problems.

Colonial America was influenced by England in many matters, including health. As cities grew, little effort was made to provide sanitation. The length of life in Boston in 1850 was even shorter than in London. The public health movement in America started with the *Report of the Massachusetts Sanitary Commission* by

Lemuel Shattuck, a report which drew its inspiration directly from Chadwick and Simon.

Shattuck was not a medical man but a statistician and a student of social problems. After his election to the state legislature he showed such interest in sanitation that he was appointed chairman of the committee to investigate these conditions. His report to the legislature was a memorable document, far ahead of its time. He gave a framework for public health programs, some of which are still not fully practiced. Among Shattuck's recommendations in 1850 were

1. Establish state and local health departments.
2. Collect and analyze vital statistics; take a census.
3. Conduct sanitary inspections by the health department.
4. Study the health of schoolchildren.
5. Study the conditions relating to alcoholism, tuberculosis, and mental illness.
6. Control smoke nuisances.
7. Study immigration and housing.
8. Supervise public bathing and laundry facilities.
9. Inspect foods and drugs.
10. Train nurses and physicians in preventive medicine.
11. Preach health from the pulpits (health education).
12. Keep family health records and have routine physical examinations.

Shattuck's ideas slowly germinated and in 1869 Massachusetts established the first state board of health. Once started, the idea spread rapidly. When Connecticut established its board in 1878, it was the seventeenth board to be formed.

By 1870 the great sanitary awakening was apparent on both sides of the Atlantic. Interest had been created and constructive activity was taking place. A clean, sanitary environment was stressed during the first phase of the public health movement.

In the meantime, in a dingy laboratory in Paris, an ardent and tenacious little French chemist was diligently working along lines that furnished a key to the second phase of public health. Pasteur's experiments proved the germ theory of disease causation and gave scientific bases for the prevention of disease. With the science of bacteriology established, the second phase of public health became possible: the control of communicable disease.

The third phase of the movement was education, and it became the dominant note. The problem was how to get the message of hygiene to the mother, the industrial worker, and the schoolchild. After all, personal hygiene is an individual matter. The first district nurses taught personal hygiene as well as care of the sick in the home. Lillian Wald founded public health nursing in the 1890's. She and her friend, Mary Brewster, moved into the slums of New York City at 265 Henry Street. Their home on an upper floor of the tenement house has grown into the Henry Street Settlement, now famous as a center of public health nursing. Lillian Wald succeeded in getting school nurses appointed in New York City in 1902. Education became, and remains, a keynote of the campaign for public health.

The fourth step in public health was the organization of medical services for detection and early treatment of disease.

The fifth step is a source of great concern today—helping every citizen to achieve his birthright of health and longevity by ensuring him a satisfactory standard of living.

QUESTIONS FOR DISCUSSION

1. Read the verses in the Bible, found in Leviticus and Deuteronomy, which contain the code of Moses.
2. Explain how the philosophy of the Hebrew religion led to the establishment of hospitals for sick people.
3. Review or relate the activities of Florence Nightingale to the sanitation movement.
4. What great scientists were contemporaries of Louis Pasteur?
5. When did the public health movement first affect your state? When was the state board of health established?

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Chapter 18

NATIONAL HEALTH RESOURCES

Elderly people living today have witnessed greater changes in the health picture of a population than have occurred during any previous comparable time in history. The changing health needs have resulted in a new concept of patient care that is oriented toward the community. If you, the nurse, are to help the patient and his family reach their fullest health potential, you should be aware of the status of health in your community, the health resources, the health problems, and possible solutions to the problems. Approach to the problems may be on the national, state, or local level.

Public and Community Health

Public health is a composite of the health of all members of the community. It is dedicated to attaining the highest level of health possible for each citizen. (A distinction is not always made between public and community health. Even the APHA does not clearly define it or make the distinction well known. But in usage, *public* means "government" and "tax-supported.") Public health agencies are branches of the government and supported by tax dollars.

The goals of community health are almost identical with the goals of public health. Both seek to achieve physical, mental, and social well-being of all the people. At a conference represented by committees of the American Public Health Association, this principle was re-emphasized, "Public health practice is the application of medical, social, and allied disciplines in an organized community activity designed primarily to protect and advance the health of the people."[1]

Community health is generally accepted as a broader term than public health. It is the organized efforts of all agencies in the community directed toward promoting the health of the community. Community health involves both private and governmental agencies.

Federal Health Services

The powers of the federal government are stated in the Constitution of the United States. In matters that affect the citizens of only one state, the state government has supreme powers. Each state has the responsibility for the health of its citizens. The federal government has no specific authority to promote public health. What authority it has, stems from the broad, general clauses of the Constitution granting the power to regulate foreign and interstate commerce, levy taxes, appropriate money, and create agencies for the common defense and the general welfare of the United States. Education and research are supported under this function. The federal government gives assistance to the states, finances education and research, and serves as a catalyst to the respective state on health matters.

The *Department of Health, Education, and Welfare* is the branch of the federal government under which are grouped many of the bureaus and agencies concerned with health. The Secretary of the Department is appointed by the President, and as a member of the President's Cabinet, participates in policy-making decisions for our country.

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[1] *Arden House Task Force Report* (New York: American Public Health Association, 1963).

Figure 18–1 shows the seven main divisions of HEW, which fulfill important responsibilities in protecting and improving the general health of the people. The Public Health Service and the Food and Drug Administration are the two divisions most involved with community health. Before considering these two in detail, let us examine briefly the functions of the other agencies.

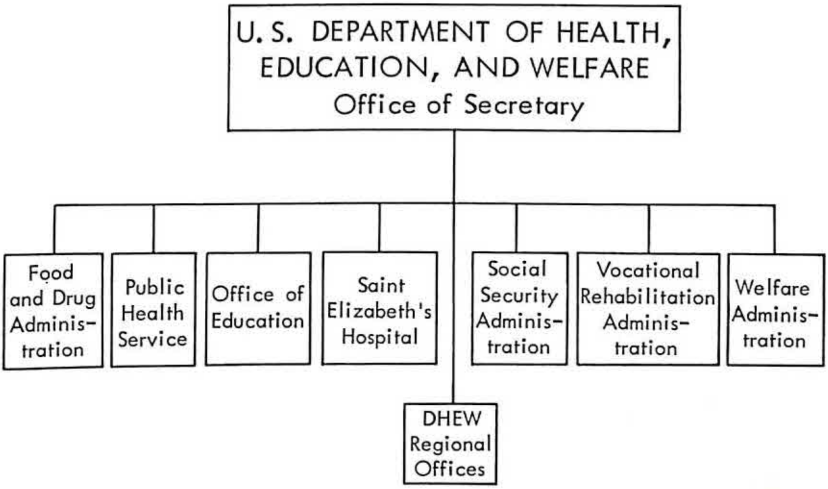
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Secretary
Food and Drug Administration
Public Health Service
Office of Education
Saint Elizabeth's Hospital
Social Security Administration
Vocational Rehabilitation Administration
Welfare Administration
DHEW Regional Offices

Figure 18–1. Organization chart of the United States Department of Health, Education, and Welfare. (United States Public Health Service Publication No. 165.)

The Welfare Administration includes the Bureau of Family Services, which administers the five federally aided programs of public assistance: old-age assistance; aid to the permanently and totally disabled; aid to the blind; aid to families with dependent children, ADC; and medical assistance to the aged, MAA. The Children's Bureau allots federal grants-in-aid to the state agencies for maternal and child health, crippled children, and child welfare services. The Children's Bureau studies, reports, and makes recommendations concerning all matters pertaining to children. The Office on Aging is the central clearinghouse for information on all programs of importance to older citizens. The Office of Vocational Rehabilitation grants funds to the states for partial payment for the rehabilitation of handicapped people, in addition to sponsoring research and demonstration projects to improve rehabilitative techniques. The Office of the Social Security Administration handles the Old Age, Survivor's and Disability Insurance, as well as the program of medical care for the aged. The Office of Education furnishes leadership to the states to improve school health services and to promote programs of health education of students, personnel, and parents. The grants-in-aid for vocational education in the health professions help to finance many schools of practical nursing.

THE PUBLIC HEALTH SERVICE

To the Public Health Service is delegated the principal responsibility of the federal government for advancing and protecting the health of the American people. It is essential that the Public Health Service obtain the cooperation of other departments of HEW, local and state health departments, and numerous volunteer agencies.

Although some direct health services are provided, the Public Health Service is mainly a leader, an indirect agent, a formulator of policies that leaves its plans to be carried out by others. For this reason the practical nurse and the general public have little direct contact with Public Health Service. However, if the practical nurse is to understand the total health picture, she should appreciate the contributions this important agency makes toward improving the health of the American people.

The Public Health Service has large numbers of trained professional people, doctors, nurses, engineers, dentists, and other health workers, whose services are lent to other federal agencies and to the state and local health departments.

Figure 18–2 shows the organization and structure of the Public Health Service. In 1964, the Service employed about 35,000 full-time personnel, with more than 90 per cent of the staff located outside the headquarters office in Washington, D.C.

General management of the Service takes place in the *Office of the Surgeon General.* The Surgeon General is appointed by the President of the United States for a four-year term. He shares the planning, coordination, and administration of Service activities with chiefs of the operating bureaus and their assistants.

Most of the federal programs reach the individual states through the nine *regional offices* of the Public Health Service. The regional staff members are specialists in public health work who maintain direct contact with state and local authorities. Their fields of specialization include such variations as chronic disease control, environmental health, and mental health.

The *National Institutes of Health* conducts and supports the scientific research which makes possible advancements in medicine and public health practice. The National Institutes of Health is located in Bethesda, Maryland, a suburb of Washington, D.C. In 1964 personnel numbered 11,000, the largest single concentration of Public Health Service personnel in the United States. In addition to the research conducted at Bethesda, the Institutes supports medical research and construction of research facilities at the nation's medical and dental schools and universities. Research is concentrated on the diseases that are the major causes of death and disability. The chart lists the nine Institutes and the four divisions. Among the more notable recent accomplishments are the discovery and development of poliomyelitis vaccines; tranquilizers and other drugs to treat mental illness; anticoagulants that can be used in the treatment of heart disease and stroke; antihypertensive drugs that reduce the number of deaths from hypertension; and an accurate diagnostic test for phenylketonuria.

Medical and hospital care programs and quarantine activities are in the *Bureau of Medical Services.* The Bureau operates a system of hospitals, clinics, health centers, quarantine stations, and other health services in this country and abroad. Some 14,000

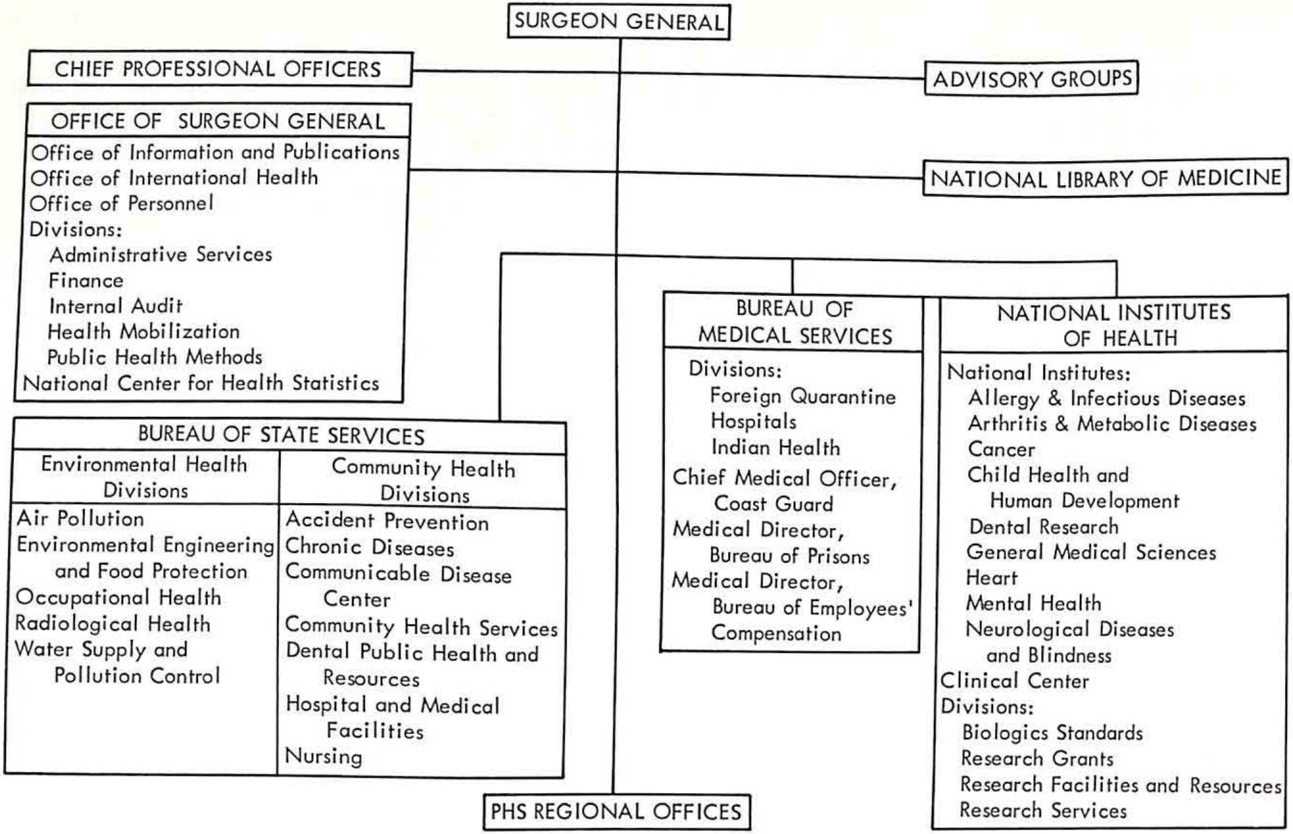
SURGEON GENERAL
CHIEF PROFESSIONAL OFFICERS
ADVISORY GROUPS
OFFICE OF SURGEON GENERAL
Office of Information and Publications
Office of International Health
Office of Personnel
Divisions:
Administrative Services
Finance
Internal Audit
Health Mobilization
Public Health Methods
National Center for Health Statistics
NATIONAL LIBRARY OF MEDICINE
BUREAU OF STATE SERVICES
Environmental Health Divisions
Air Pollution
Environmental Engineering and Food Protection
Occupational Health
Radiological Health
Water Supply and Pollution Control
Community Health Divisions
Accident Prevention
Chronic Diseases
Communicable Disease Center
Community Health Services
Dental Public Health and Resources
Hospital and Medical Facilities
Nursing
BUREAU OF MEDICAL SERVICES
Divisions:
Foreign Quarantine
Hospitals
Indian Health
Chief Medical Officer, Coast Guard
Medical Director, Bureau of Prisons
Medical Director, Bureau of Employees' Compensation
NATIONAL INSTITUTES OF HEALTH
National Institutes:
Allergy & Infectious Diseases
Arthritis & Metabolic Diseases
Cancer
Child Health and Human Development
Dental Research
General Medical Sciences
Heart
Mental Health
Neurological Diseases and Blindness
Clinical Center
Divisions:
Biologics Standards
Research Grants
Research Facilities and Resources
Research Services
PHS REGIONAL OFFICES

Figure 18–2. Organization chart of the United States Public Health Service. (United States Public Health Service Publication No. 165.)

staff members are engaged in direct medical care activities. We have mentioned the two neuropsychiatric hospitals which treat drug addicts. Medical and hospital care is provided for specified eligible persons, such as American seamen, American Indians and Eskimoes, commissioned officers and employees of Public Health Service, and federal prisoners. To prevent introduction of communicable diseases from abroad, the Division of Foreign Quarantine inspects ships, aircraft, persons, and certain animals and goods arriving in this country.

The *Bureau of State Services* helps to strengthen state and local health department programs by making available technical consultation, demonstration projects, training courses for health personnel, laboratory services, and federal grants-in-aid.

The Community Health Division promotes improved health services for the chronically ill or disabled. The Communicable Disease Center, with headquarters in Atlanta, leads the attack on infectious diseases. It carries out studies and investigations. If an epidemic or disaster strikes a community, the center can send help within twenty-four hours. Specialists, singly or in teams, go to help bring the situation under control. Federal aid for hospital construction is administered under the Hill-Burton Act. Funds have also been granted to construct buildings to house nursing schools and to provide for fellowships to train qualified nurses for leadership positions.

The Environmental Health Division is concerned with hazards produced by the rapid growth of cities and the increase in industrial production. Research studies conducted at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio, investigate problems in air pollution, water supply and pollution control, milk and food sanitation, and radiological health.

The Artic Health Research Center in Anchorage, Alaska, was established to cooperate with other nations, particularly Canada, in seeking knowledge about the effect of low-temperature environment on health.

FOOD AND DRUG ADMINISTRATION

After the Public Health Service, the Food and Drug Administration is next most involved with national health. The Food and Drug Administration is a scientific institution and a law-enforcement agency that tries to safeguard the public health and finances in regard to foods, drugs, and cosmetics. The FDA is responsible for administration of the Pure Food, Drug, and Cosmetics Act.

The Pure Food, Drug, and Cosmetics Act was passed to protect the public against unsafe foods, harmful cosmetics, adulterated foods, untested drugs, and misbranded products. The law provides for food inspection and control of manufacturing processes, control of bacterial count, and investigation of food poisoning outbreaks. It defines and prohibits adulteration and misbranding of foods, drugs, and devices sold to the public. The law does not prohibit the sale of inexpensive, second-quality foods, providing these foods are wholesome and clean. It does require the labels to identify second-quality products so that the customer knows what he is buying. It requires the package to contain the quantity stated on the label. The law helps to protect honest manufacturers and dealers against unfair competition from inferior or dishonestly labeled goods.

To carry out this work, the FDA inspects the factories where foods, drugs, and cosmetics are manufactured or processed; tests samples of products; and checks the results of the tests against information on the labels. The FDA is authorized to seize offending merchandise, to obtain injunctions, and to take criminal action against those violating the law.

The thalidomide experience of 1962 resulted in worldwide publicity and focused attention quickly and forcefully on the need to check new drugs for safety before permitting uncontrolled distribution. The FDA, in particular, Dr. Frances Kelsey, refused all pressures to approve the sale of the thalidomide tablets, thus keeping the dangerous drug off the United States market. Later investigations disclosed that the use of the drug by pregnant women frequently resulted in severe fetal malformations. Only sixteen malformed babies were born in the United States, as contrasted with 4,500 such births in West Germany.

Limitations of the FDA

Despite the diligent efforts of the Food and Drug Administration, weaknesses exist permitting unscrupulous people to make money. The nurse can help the public to realize that the competent and vigilant FDA has limitations.

The burden of proving a product is misbranded rests with government agencies. The promoters of the product can take the case to court. Frequently they bring forward witnesses who sincerely believe that the product helped them. The court case can continue for years. It took eight years of court action for the FDA to get one misbranded drug off the market.[2] Meanwhile, the promoters continued to make money and to deceive the public.

Efforts to control the spread of misinformation are hampered because books cannot be banned unless a specific drug or product is commercialized. Books which advocate weird health theories may be sold lawfully. The books often encourage readers to waste money or health on self-medication.

The FDA's limitations involve principles that many people approve. However, one weakness could be eliminated without infringement on constitutional rights. The FDA is empowered to act only if the product is transported across state lines. An estimated 25 to 40 per cent of our foods, drugs, and cosmetics are sold within the state where they are produced. The obvious solution would be the passage of uniform state laws. All of the states have food and drug laws, but some laws are totally inadequate. Hence medical quackery flourishes.

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[2] Elizabeth Cunningham and Oliver Field, "Medical Quackery," *Journal of Practical Nursing* (February 1964), pp. 16–17.

Fight Against Medical Quackery

Medical quackery flourishes most in areas of unresolved medical problems. Thus, as proper treatment has been developed for tuberculosis and diphtheria, the fake cures for these diseases have almost vanished from the market. Today quack cures for cancer, arthritis, and arteriosclerosis continue to multiply. Fantastic sums of money and vain hopes are also wasted in the areas of mental retardation and nutrition.

According to the Arthritis and Rheumatism Foundation, arthritics alone pay more than $250 million annually for quack drugs, devices, and treatments. The FDA has estimated that quackery costs the American public $1 billion a year.[3] Despite the huge sums of money wasted, the greatest damage caused by medical quackery is the delay of treatment. For example, an estimated 100,000 deaths yearly are traced to the failure of cancer victims to seek reputable medical help in time. Many of these people try quack remedies first.[4]

Today many older Americans are victimized by quacks and charlatans. The elderly person, alone and frightened, may be easy prey to the glib-talking salesman who promises to restore youth or health. Displayed at the second Congress on Medical Quackery, sponsored by the FDA and the American Medical Association, were fifty-six outlawed mechanical devices claiming to be effective for enhancing beauty.

To detect the quack treatment, be alert for the following: [5]

1. Is the formula or treatment said to be "exclusive" or "secret"?
2. Does it promise a quick cure?
3. Is it advertised by case histories or testimonials?

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[3] Elizabeth Cunningham and Oliver Field, "Medical Quackery," *Journal of Practical Nursing* (February 1964), pp. 16–17.

[4] Martha Dudley, "Why People Fall for Quackery," *RN* (January 1963), p. 48.

[5] "Drugs and Cosmetic Quackery," *FDA Feature No. 6*, release from the Food and Drug Administration, U.S. Department of Health, Education, and Welfare, Washington, D.C. (May 1964).

4. Does the sponsor clamor for medical investigation and recognition?
5. Does the sponsor claim medical men are persecuting him or fear his competition?
6. Are the recognized treatments belittled? (The usual drugs, x-ray, and surgery are said "to do more harm than good.")

If the answers to any of these questions is "yes," be wary.

Quack treatments are sold with fake ads, testimonials, and tricky wording. The personality of the salesman is a big factor. His suave and convincing manner, his promises of certain and quick results are more alluring than the reputable physician's scientifically based prognosis. In many situations the quack does not *say* that his treatment will cure, but *implies* so. The information printed on the label may be vague, claiming, for example, "to build body resistance."

The fact that cancer and arthritis sufferers often have periods during which their pain subsides can benefit the quack. If the arthritic's pain eases while he is wearing a "magic charm bracelet," he is certain the charm caused it, and he may testify to that in court.

The quack is a supersalesman who sells "hope" at high prices. This reveals one reason why the charlatan can deceive the fearful, the despairing, and the ignorant. He offers the hope that the reputable physician cannot.

Controls Against Quackery

Several agencies try to protect the public against fakes and swindles in the health field. Foremost is the Food and Drug Administration, empowered by law to take court action against foods, drugs, cosmetics, or devices sold in interstate commerce, if their labels carry false or misleading claims. The shippers may also be prosecuted or enjoined, or both. In addition, the FDA tries to educate the public in matters of food and drug control.

The Federal Trade Commission is an independent agency authorized by Congress to control price fixing. The Commission was directed to note the advertising of foods, drugs, devices and cosmetics and to help eliminate false or misleading advertising sent through the mail or across state lines.

The United States Post Office is authorized by law to bar the use of the mail to those who solicit money for fraudulently or falsely advertised medical and scientific evidence in cases involving foods, drugs, or cosmetics.

The Better Business Bureau is a private agency which collects and makes available information on quack remedies sold on a mail-order or door-to-door basis. The Better Business Bureau has no legal power and can only pass along information.

The American Medical Association maintains a Bureau of Investigation which exposes quacks and fads in its two magazines, the professional *Journal of the American Medical Association* and the popular magazine, *Today's Health.* The bureau also answers inquiries about the value of specific drugs, foods, or devices in the treatment of disease or the promotion of health. For years the AMA has pressed the fight against medical quackery by promoting legislation against it and financing an active educational program.

What the Nurse Can Do

As a practical nurse you can help people to form the following reasonable habits in the use of drugs and devices. First, rely on the advice of a licensed physician. Second, read carefully the directions on the container or the instruction leaflet. The fine print contains important facts. Third, be cautious and skeptical of cure-alls.

You can play an important part in the campaign against quackery. In your role of health teacher, you may have opportunities to warn your patient about quack products that he may be using in addition to those prescribed by the physician. Also, your advice may be sought by friends and friends-of-friends who are hesitant about going to a physician.

All nurses can help the patient and the family by reassurance and explanations. The busy doctor does not spend the hours with the patient or the family which the nurse does. While the nurse performs her regular bedside duties, she can reassure and explain. If the patient and the family can accept the diagnosis and the truth, they will be less likely to turn to quacks. Tell the family what is known about the disease or the condition and explain the known treatments. Bolster their faith in the medical profession by pointing out some recent advances. If possible, tell them about patients you have cared for whose illness was similar to theirs and who were helped. Assure them that present-day drugs prescribed specifically for them by a reputable physician can do much to help them (even if they have a malignant disease). Finally, warn them against quacks and quackery, and tell them how to recognize the quack practitioner.[6]

QUESTIONS FOR DISCUSSION

1. Who is the present Secretary of Health, Education, and Welfare? Who is the Surgeon General of the Public Health Service?
2. Name a cosmetic or drug that has been removed from the market by the Food and Drug Administration.
3. Describe a quack product or treatment that you have known people to take seriously.

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Chapter 19

STATE HEALTH DEPARTMENT

The public and voluntary health organizations strive to make knowledge of health available to the average person in a form he can understand and incorporate in his daily living. The nurse who is truly professional and interested in the welfare of her patient will want to know the services offered by her state health department.

Each state health department is organized to fit the unique needs of the citizens of that state and to coordinate with other health and governmental agencies; hence no two state health departments are alike. Yet there are enough similarities for us to be able to study the responsibilities, the general purposes, and essential activities of state health departments.

Legal Powers

The Constitution of the United States delegates legal responsibility for public health programs to the individual states. The state's authority in the health field is derived from its general power to legislate for the protection of the public safety, health, and morals.

The federal government's influence is now greater than ever before because increased financial aid is being given to the states.

Certain powers have also been given to the federal government as the states realize that communal action is necessary or more beneficial, as with flood controls and water and air pollution.

Responsibilities of State Health Departments

The first responsibility of the state health department is to help the local health department to do the best job possible. Thus, many of the activities of the state health department are advisory in nature, with the actual work done by the city, county, or township level of government. The state health personnel serve as consultants to the local department.

In counties without a full-time local health department the state department of health may provide direct services. Its staff may inspect meat-packing houses, public eating places, or nursing homes. The state health department often provides specific services that are impractical for each area to maintain. Laboratories requiring special equipment are too expensive for every local department to support. Vital statistics and records may be handled more efficiently in a central office than in each local office.

The state health department should coordinate the activities of all the agencies and personnel working with public health in the state. This means obtaining the cooperation of physicians, dentists, hospital administrators, nutritionists, medical social workers, voluntary agency personnel, and other professional people. The state health department works with other official departments of the state government, such as departments of mental health, welfare, education, and agriculture.

The state health department promotes legislation on health problems by providing facts and information to legislators or interested people. It also cooperates with other states and with the federal government in interstate health affairs and it stimulates or conducts state-level research programs. It prepares and distributes health education material as well as recruiting and helping to educate health professional personnel and offering consultant services to community organizations.

The state health department publicizes the regulations or sanitary codes which have the force of law. One of its important functions is to *enforce* the state health laws and regulations. The state health department issues licenses required by law; conducts hearings relative to the taking of land for the public health; reviews and approves plans for the construction of schools and hospitals; and carries out other similar duties.

Location and Housing

The state department of health should be located so that it is accessible to the people, the health workers, and other state agencies. Its location near other health facilities can be mutually beneficial. A close association between a state health department and a school of public health, a school of medicine, or a teaching hospital is good if the health department can operate its program without undue outside pressure.

A health department can fulfill its responsibility more effectively if it is housed in adequate facilities, including meeting rooms and an auditorium. Sufficient parking places are necessary in this day of the automobile. If tax dollars from your state have been used to construct a fine building, the tax dollars were well spent.

Organization

Public health is such an important matter that each state should have an independent department of health responsible directly to the governor. The state health department is composed of the state health officer, his staff, and the board of health, which comprises the advisory or policy-forming body.

The health officer is appointed by the board of health or by the

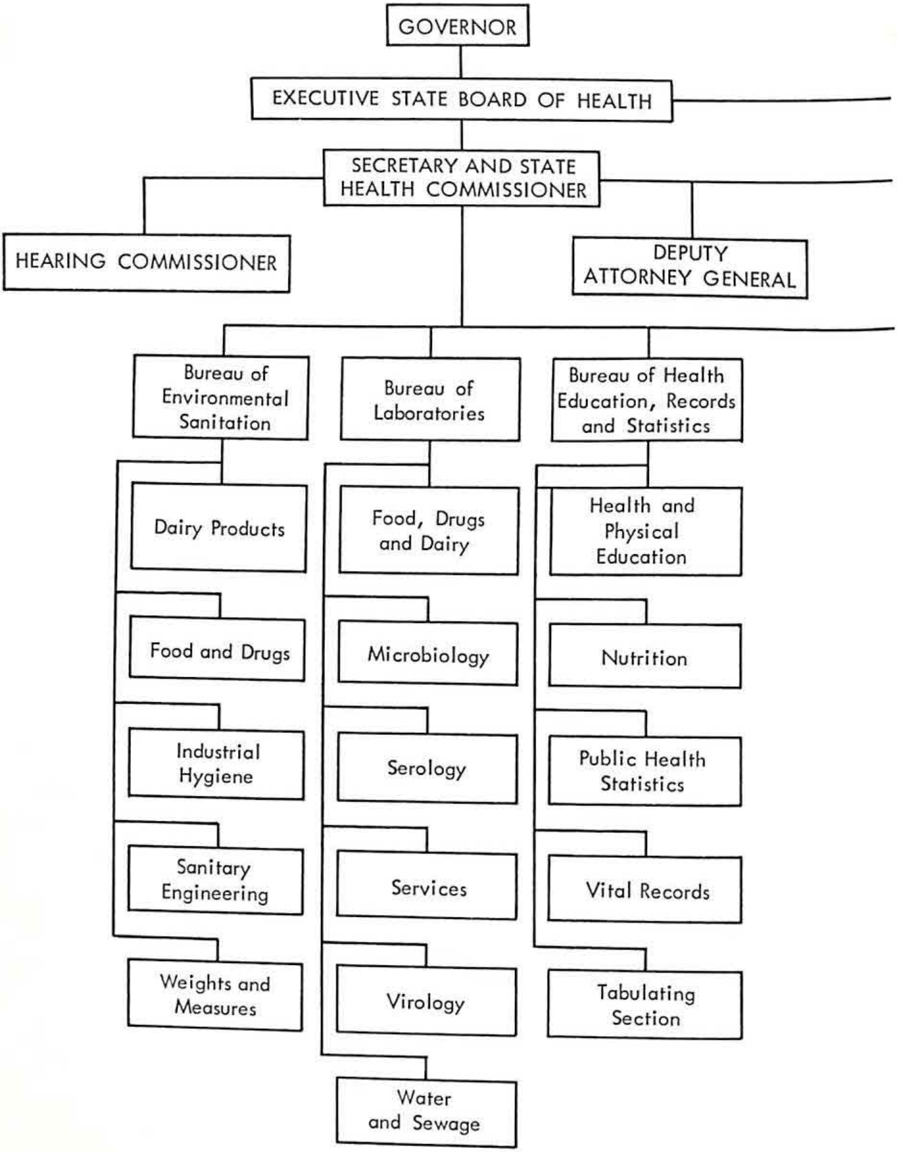
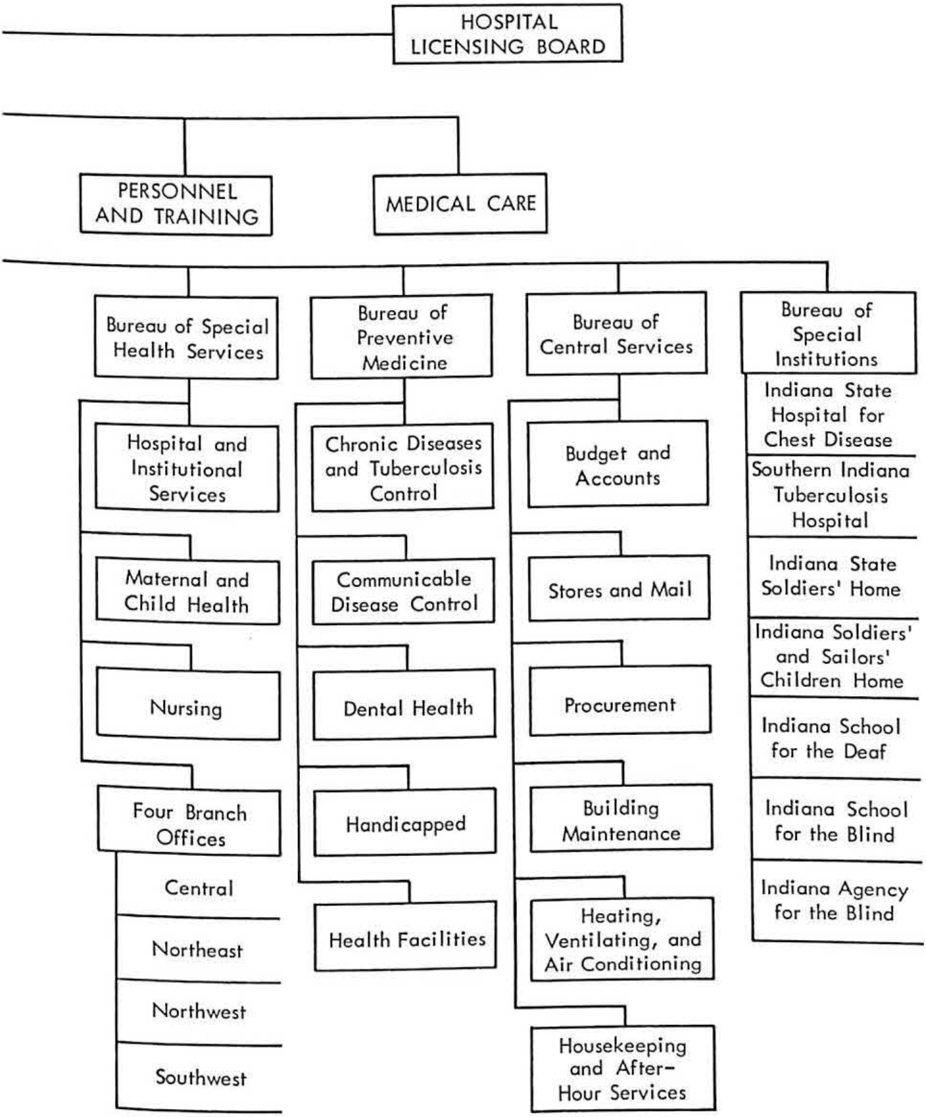


Figure 19–1. Organization chart of the Indiana State Board of Health.


HOSPITAL LICENSING BOARD
PERSONNEL AND TRAINING
MEDICAL CARE
Bureau of Special Health Services
Hospital and Institutional Services
Maternal and Child Health
Nursing
Four Branch Offices
Central
Northeast
Northwest
Southwest
Bureau of Preventive Medicine
Chronic Diseases and Tuberculosis Control
Communicable Disease Control
Dental Health
Handicapped
Health Facilities
Bureau of Central Services
Budget and Accounts
Stores and Mail
Procurement
Building Maintenance
Heating, Ventilating, and Air Conditioning
Housekeeping and After-Hour Services
Bureau of Special Institutions
Indiana State Hospital for Chest Disease
Southern Indiana Tuberculosis Hospital
Indiana State Soldiers' Home
Indiana Soldiers' and Sailors' Children Home
Indiana School for the Deaf
Indiana School for the Blind
Indiana Agency for the Blind

(By permission of Indiana State Board of Health, Indianapolis.)

governor upon the recommendation of the board. His term of office should be long enough to assure reasonable continuity. The board of health or the state legislature set the requirements for the health officer, usually stating that he be a licensed physician with experience in public health administration. The health officer serves as a consultant to the governor, the legislature, and others in state government.

The board of health usually has seven to nine members, appointed by the governor for staggered terms of office, from five to seven years each. Membership should adequately represent the medical profession and the public, with no single professional or business group in majority.

The pattern of public health organization is more varied on the state level than on the local level. Trends are toward increasing control of state health departments by governmental budgets, personnel and comptroller officials; toward greater coordination with voluntary agencies; and toward the grouping of divisions having similar services into bureaus.

Figure 19–1 (pages 294–295) shows the organization of the health department of Indiana. Despite differences in organization, the activities described in the following paragraphs are provided for somewhere in the make-up of each state health department.

Environmental Sanitation

Services relating to environmental sanitation are handled in all state health departments, whether grouped in one bureau or dispersed throughout several departments.

The sanitary engineering division is concerned with public water supplies and public sewage disposal systems, air pollution control, and industrial waste treatment. Usually the supervision of private water supplies and private sewage disposal facilities will be under the jurisdiction of the local health department. State sanitary engineers offer consultation and technical advice to industries and municipalities, which is particularly valuable in the building of new industries or public works.

The licensing of mobile home parks and motels is a responsibility of the state health department.

The supervision of food and milk sanitation is usually the dual responsibility of the state and local health departments.

The division of foods and drugs of the state department has the responsibility of enforcing laws and ordinances in relation to foods, drugs, and therapeutic devices sold in the state. The FDA and the state foods and drug section try to cooperate fully. The state department provides for inspection of canning factories, meat-packing houses, locker plants, frozen food processing plants, and all manufacturers, repackers and distributors of foods, drugs, and cosmetics. Possessing police authority, the inspectors are authorized to enter premises, collect samples, initiate complaints in court, and when necessary, remove from the market dangerous, filthy, or misbranded foods and drugs. They inspect food services at the state institutions, state parks, and temporary stands at the state fair. Every year increased numbers of food handlers are educated by the state health department.

The occupational or industrial hygiene division seeks to eliminate occupational injury or disease. Staff members visit industrial plants, inspect working conditions, evaluate hazardous chemicals or physical agents, and issue adequate control recommendations.

Laboratories

Most states maintain a diagnostic laboratory for communicable diseases and a laboratory for the analysis of water and sewage samples. Many states have additional laboratories for food and drug control, serology work, milk analyses, shellfish, and industrial health.

The services of the diagnostic laboratory are commonly available to other departments of the state health departments, private physicians of the state, and hospitals or clinics needing assistance. In some areas the services of the various laboratories are available to private laboratories and to the physicians, as well as to the public hospitals; in other areas these services may be available only to official agencies. A growing function of the state health department is to approve laboratories in local health departments and hospitals, such as those performing diagnostic tests for syphilis.

Vital Statistics and Records

All state health departments are responsible for the registration of births, deaths, morbidity, marriage and divorce records, and for the analysis and interpretation of data obtained from the records. The records of the vital statistics for the state must be available for research programs and for correlation with the census data. Records are important in evaluating past public health programs and in planning for future programs.

Education

All personnel within the state health department participate in a health education program. The division of health education is charged with coordinating the educational programs in various departmental units, with preparing educational materials, and with promoting health education. For the most part the staff members work with leaders from various parts of the state. They conduct workshops for health education teachers, nurses, and community leaders. A workshop may be given for public health nurses to give them current information on nutrition, which they take back to their communities.

The state health education people help teachers in schools and colleges to develop programs and to distribute health education materials. Undoubtedly the instructors in your practical nursing school have borrowed films or received literature for classwork from the state health department.

Nutritionists in the state health department work toward improving food service in hospitals, nursing homes, county homes, children's institutions, and public schools. They assist in training health personnel. In large states nutritionists may be assigned to a separate division, organized similarly to the public health nurses.

Public Health Nursing

The number of public health nurses employed by the state health department is often proportionately smaller to the total number of staff than in the local health department. If local health departments have adequate staffs of public health nurses, the nurses in the state health department have little need to give direct patient care. A state may have one director of public health nursing, three or four specialized consultant nurses (specialists in certain fields of nursing), and nurses assigned to each area or district of the state. These nurses give advice, consultation, and supervision to district and local personnel. Nurses are also employed to assist other units in the state health department and to work with other state agencies.

Preventive Medicine

Large states have separate divisions for such communicable diseases as venereal disease and tuberculosis; smaller states may combine their services.

The communicable disease responsibilities of the state are to collect data from local health departments and publish reports on the incidence of disease; assist or conduct epidemiological investigations; promote immunization programs; develop isolation and quarantine regulations; and educate the people relative to the prevention and treatment of contagion during outbreak.

Most states have special programs for tuberculosis case-finding activities, such as conducting mass x-ray or skin-testing surveys and studying population groups with high rates of tuberculosis.

The dental health division seeks to upgrade dental care for the people of the state. Some states have made studies and surveys concerning the effectiveness of fluoride treatments. In Indiana, the state health department helped to put into effect the 1962 law requiring all high school football players to use mouth protectors.

Maternal and Child Health, Crippled Children

The goal of the health department is to protect and to promote the health of mothers and children throughout the state. This is accomplished mainly by consultation with groups or individuals who render direct services to the people. The state health department may offer a training course or workshop for nurses who plan to teach expectant parent classes. Maternal and child health programs pay special attention to services for the mother during the antepartum, partum, and postpartum period; and for the child during infancy, preschool age, and school age.

The state health department cooperates with the department of education in promoting school health programs. For example, it may help the elementary schools to establish programs for examining and correcting the vision of their pupils.

In most states, the health department also operates the crippled children's services.

Institutions, Hospitals, Nursing Homes

The operation of the state hospitals, institutions, and sanatoriums by the state health department consumes considerable budget and staff time.

The state health department usually supervises and issues licenses for public and private hospitals, clinics, convalescent homes, nursing homes, and boarding homes for the aged within the state. The growing population of older Americans indicates an increased demand for nursing home beds and greater attention to the standards of care given in nursing homes. Periodic inspections of nursing homes and hospitals determine compliance with state regulations.

The state health department is also responsible for administration of the Hill-Burton Act, by which federal funds are available for hospital or nursing home construction.

QUESTIONS FOR DISCUSSION

1. Obtain and study a copy of the chart showing the organization of your state health department.
2. Show pictures of, or visit in person, the headquarters building for your state health department.
3. Who is the health officer in your state? How is he selected?
4. Obtain a copy of the yearly report for your state health department. Note the research projects and the particular programs emphasized.
5. Obtain a copy of the regulations of your state concerning isolation of and quarantine for communicable diseases and keep this copy for reference.

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Chapter 20

LOCAL HEALTH DEPARTMENT

Abraham Lincoln once said, "The legitimate object of government is to do for a community of people whatever they need to have done but cannot do at all, or cannot do as well for themselves in their separate and individual capacities. In all that the people can do as well for themselves, the government ought not to interfere." Public health is an area in which the individual cannot act alone; he must have governmental help.

Public health is enacted at the local level. The local health department is the usual contact for the nurse and the public. If the nurse understands the goals sought and the services provided by the local health department, she can more adequately fulfill her supporting role. Each local unit has unique features, yet certain general functions and activities are similar for all local health departments.

Legal Status

The chief responsibility for the enforcement of health and sanitary practices has been delegated to the local health department through the state constitution and acts of legislation. The health department, like the schools, police, and fire department, is a part of local government.

In a few states, the local health department is a branch of the state government. However, the local health department usually acts as an independent unit.

SHARED RESPONSIBILITY

The local health department shares the responsibility for public health protection with many other community organizations and with many individual professional people. Figure 20–1 shows the relationship of the Brookline, Massachusetts, health department to other organizations.

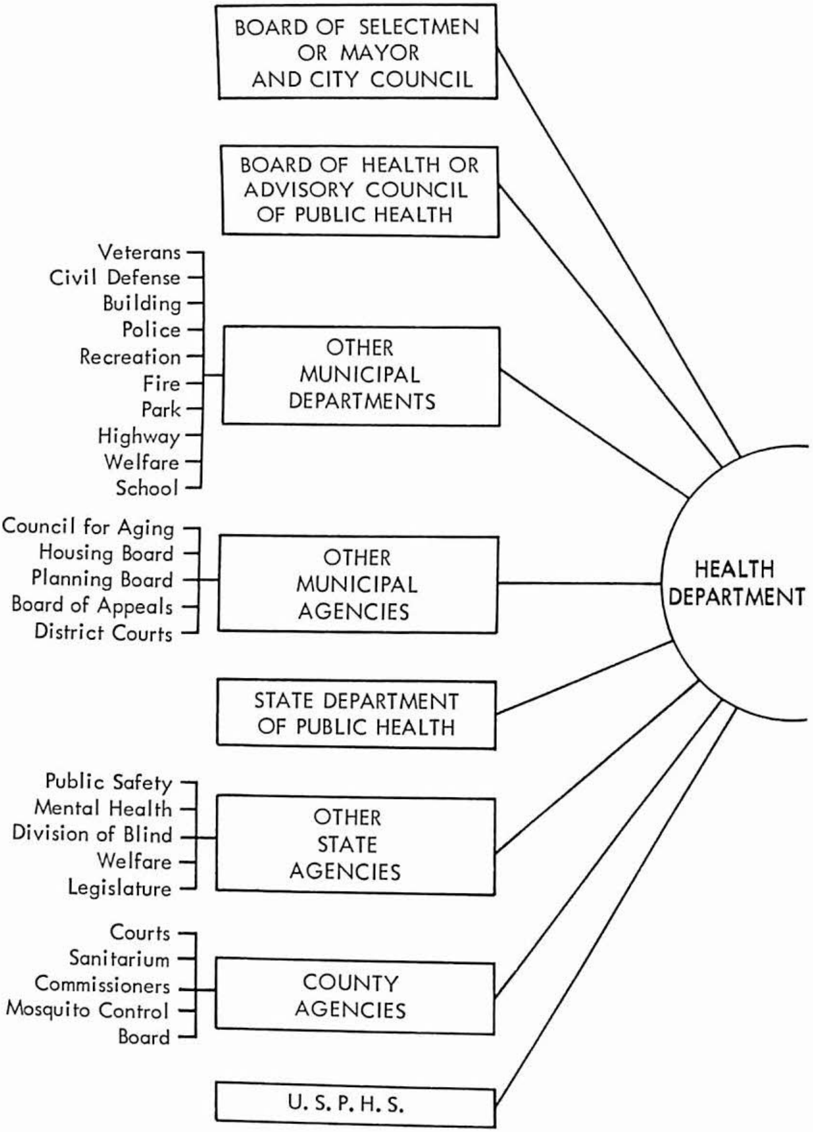
The trend today is toward increased cooperation of the local health department with other agencies, and toward more regional planning. As we examine the public health problems of today reasons for this trend become obvious.

New Problems in Public Health

Since World War II the health needs of the American people have changed drastically. The discovery and use of antibiotics have helped to control bacterial disease, only, it seems, to make room for viral diseases. Prior to 1946, there were sixty known viruses capable of infecting man. Now more than 200 have been identified.

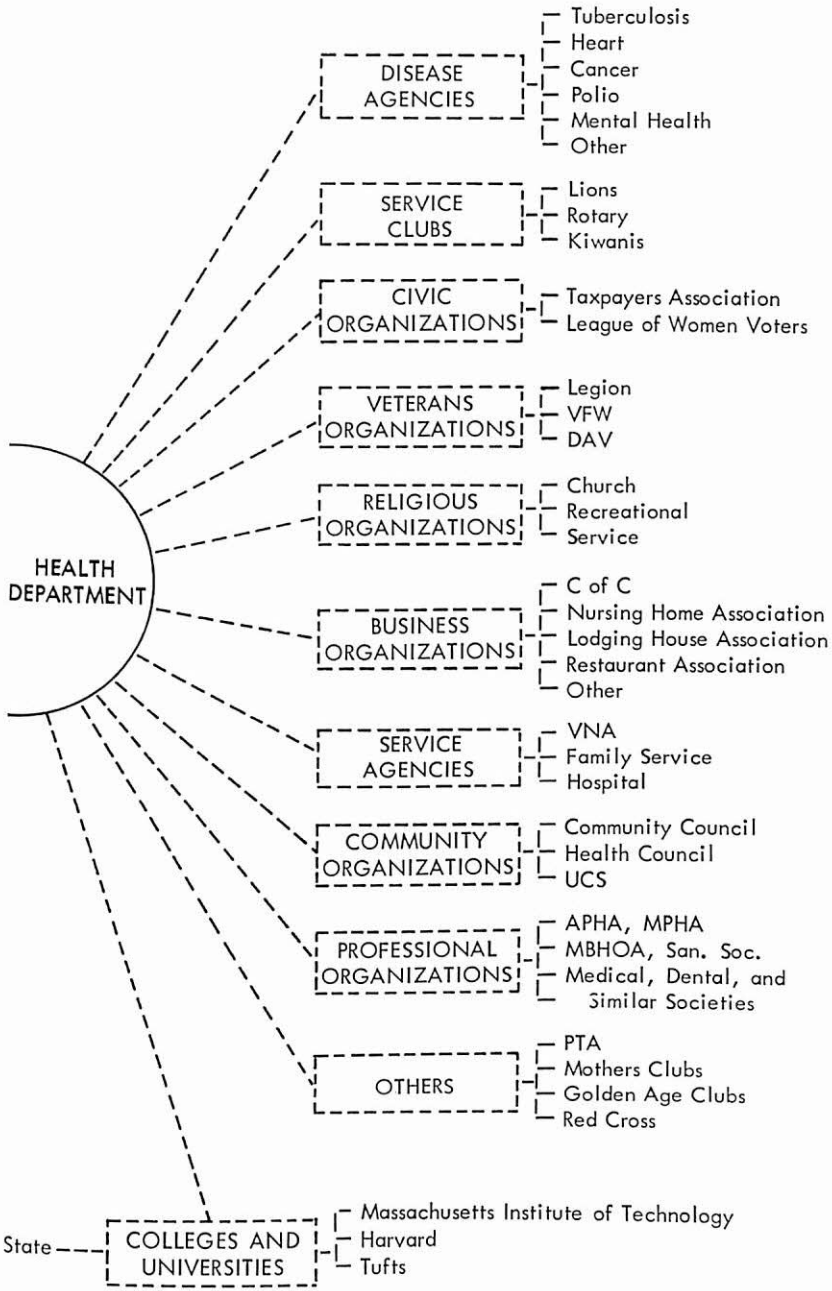
Man is living longer because he has better control of infectious diseases, better surgical techniques, and better drugs, but an increasing number of elderly people present new health problems. New techniques in physical rehabilitation mean more useful lives can be lived by many more people stricken with chronic, disabling conditions. The splitting of the atom has led to development of two new fields of public health—radiological health and civil defense.

The health department is faced with the problem of making the best and most efficient use of medical care facilities. Prepaid



- - - - - - Voluntary Agencies
———— Official Agencies

Figure 20–1. Organization chart showing relationship of Brookline, Massachusetts, Health Department with other organizations. (By per-



mission of Brookline Health Department, Brookline, Mass., and Leon J. Taubenhaus.)

medical care (hospitalization insurance), prosperity of the working man, and increasing governmental activity have helped to generate pressure to build more hospitals and to seek ways of using them wisely. Increased demand for medical care has led to emphasis upon services given in medical care facilities such as the health center, nursing home, outpatient clinic, and chronic illness hospital.

Medical research on an unprecedented scale has disclosed important new knowledge, which public health workers are expected to apply. Research has also produced hosts of new synthetic substances in touch with man. *Index Chemicus* reported that in 1960 alone, 75,000 man-made compounds have been created in laboratories around the world. The impact of all these chemicals, including drugs, food additives, pesticides, herbicides, and detergents has not yet been fully assessed.

Possibly the biggest problems are the result of the tremendous increase in population, and its redistribution into the suburbs. The growth of cities and the birth of suburbia have created entirely new public health problems and intensified the old ones. More people living closer together require increased amounts of water and air, and produce more wastes for disposal. Industry has grown and diversified with more by-products to be discharged. Cities are faced with smog, water pollution, overcrowding, noise, poverty, and crime—all rising.

One fact is indisputable: man now changes his environment in so many ways that he can no longer rely on the slow-moving forces of nature to protect his health, or even to ensure his survival as a species. Now and forever, man must guard his environment to protect his own genetic destiny.

REGIONAL PLANNING

The local community has previously been almost completely responsible for the health of its people, but a look at the complex urban problems of today reveals why local determination may not be adequate. For example, when a prosperous community depends upon a large industrial factory as a source of employment and tax revenue, a local health officer may hesitate to criticize or attempt to regulate the wealthy industry in his community that is polluting or contaminating the air with untreated waste products. State and federal laws are proving to be more effective in subordinating the preference of the individual agency to that of the wider interests of the entire community or state.

Regional planning is important for both present and future metropolitan areas. The most efficient use of the precious natural resources of land, water, and air increasingly requires long-range planning with citizens groups and local, state, and federal agencies. It is unthinkable that local and state health departments alone can make much progress in urban planning. All units of the community—the city and county governments, business, industry, and the general public—must help to build a better environment.

LOCAL ELEMENT ESSENTIAL

The local health department can assume the leadership in long-range planning. It should identify the health problems of the community. By keeping abreast with progress in science and technology, the health officials can attempt to solve the problems and prevent crises. They can have scientific facts to present when cooperating and participating in social planning with other governmental and private agencies.

The Arden House Task Force [1] has divided the functions of the local health department into three major responsibilities:

1. Promotion of personal and community health.
2. Maintenance of a healthful environment.
3. Aggressive attack on disease and disability.

Discharging these responsibilities adequately requires certain data, knowledge, judgment, and organizational structure.

To improve the environment, promote health, and prevent disease, it is necessary for people to change attitudes, practices, and habits—a slow, difficult process. The local health officials work directly with the people and try to encourage and show them how and why to change. No disease on record has been brought under control with scientific knowledge alone. Preventive medicine must accompany treatment. The cause and cure for venereal disease is now known, yet a sharp increase in the incidence of venereal disease was reported in 1964. To eliminate venereal disease, it will be necessary to educate people and to influence them to change attitudes. This is where the local health officials enter the picture. The local health department is engaged in preventive medicine.

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[1] Committee of the American Public Health Association, meeting held September 12–15, 1963.

To understand the functioning of a local health department, let us examine organization, staffing, and activities that are typical (Figures 20–2 and 20–3).

Organization and Staff of Local Health Department

Policies for the local health department are usually determined by a bipartisan board of directors appointed by elected public officials, such as the mayor or county commissioners. The board usually has tax-levying authority, subject to approval by the state board of accounts. The board ordinarily has the power to pass ordinances, which are quasilegislative.

An ordinance is not a statutory law, but it has the effect of a law. An ordinance provides for the enforcement of people's behavior. It is a guide for performance. It sets standards, as a housing ordinance sets the minimum standards for adequate housing.

The board of directors appoints the health officer whose professional qualifications are probably those of a physician with experience in public health.

A full-time local health department is comprised of a board of directors, health officer (physician), public health nurse, sanitarian, and record clerk. The ideal community size would be 50,000 people, which would allow support of all the basic health

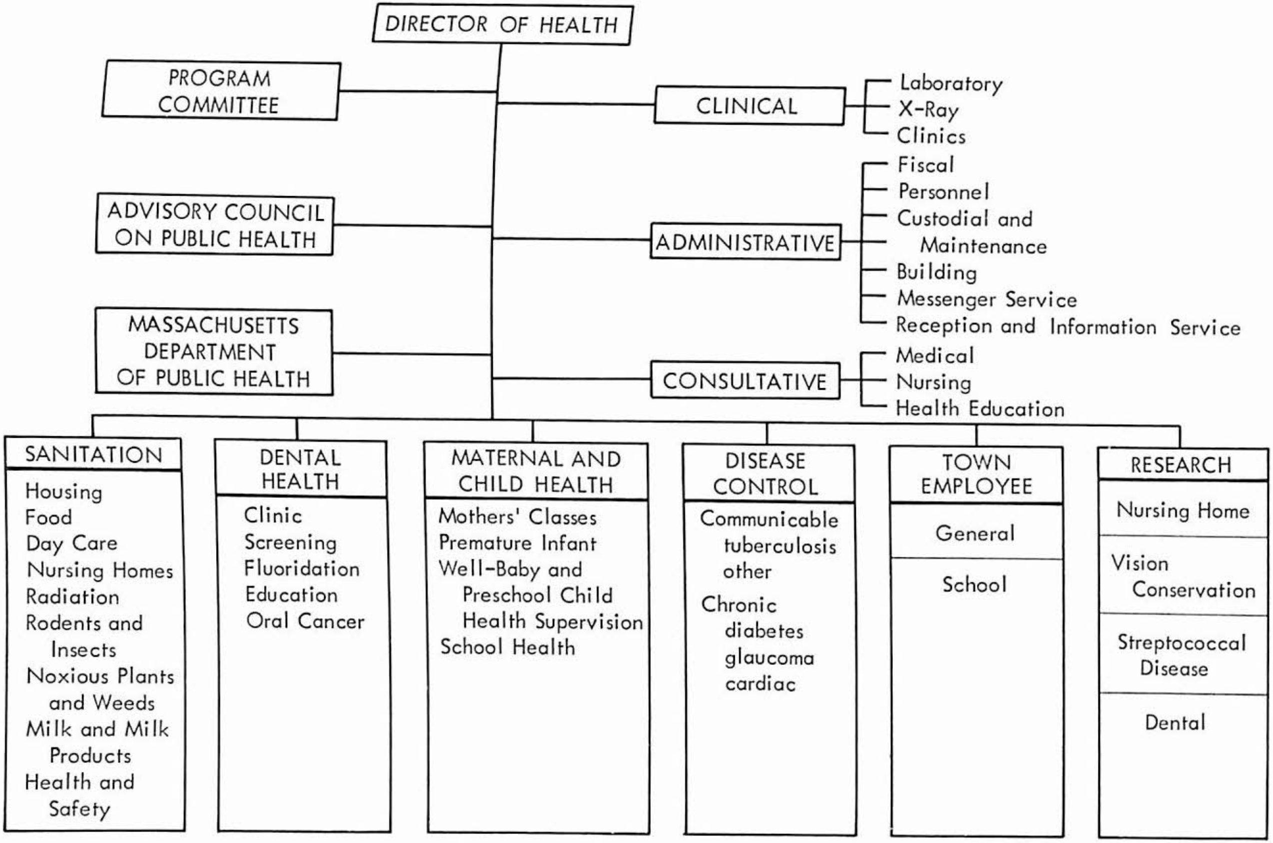

Figure 20–2. Organization chart of the Brookline, Massachusetts, Health Department. (By permission of Brookline Health Department, Brookline, Mass., and Leon J. Taubenhaus.)

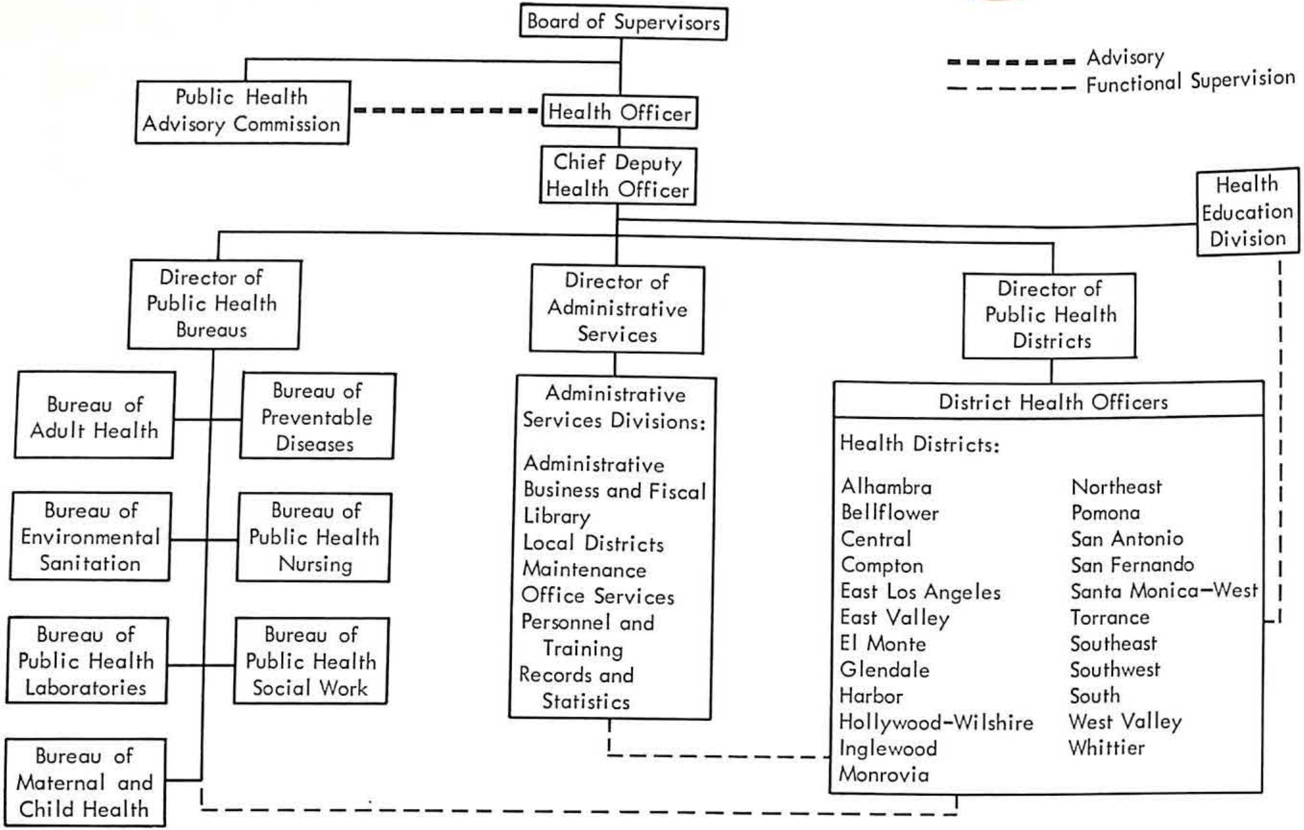

Figure 20–3. Organization chart of the Los Angeles County Health Department. (By permission of the Los Angeles County Health Department, Los Angeles, Calif.)

services. A staff for an area this size might comprise the following; one health director, eight public health nurses, two public health sanitarians, two laboratory technicians, one sanitary engineer, one health educator-nutritionist, and two clerks. Of course, the number of staff personnel is modified to fit the territorial factors and population distribution.

The area served by a local health department may be a city, town, or county. A county health department emphasizes rural sanitation, which includes pure water supplies, proper sewage disposal, and elimination of flies and mosquitoes. A city health department emphasizes urban problems of environmental health and sanitation.

Activities in Seven Areas

Administration of a health department is involved with details of operating the service, such as payroll, budgets, and care of the building.

Vital statistics are records of the births, deaths, and communicable diseases in a community. The records show what is happening and reveal the health problems. If the cause of illness and death are known, the health officers can decide what to do. The leading national cause of death is heart disease, followed by cancer and stroke. Suicide, as a cause of death, ranks twelfth in Indianapolis, and eighth or ninth nationally, and higher than that in San Francisco and New York. The vital statistics yield more up-to-date records than the census reports, hence are valuable sources of information to other citizens in the community. By projecting population growth, school officials know where to locate schools. One city noted a rise in illegitimate births, with a corresponding increase in the death rate of these babies. Follow-up action was to provide four additional public health nurses to seek out the pregnant unwed women and help them get needed medical care.

Public health laboratories provide for testing milk, water, food, and sewage effluent. For example, in case of suspected foodborne illness the food is tested for presence of pathogenic microorganisms. Animal heads are examined for rabies. Other state laboratory services brought closer to the county or city are blood testing, stool cultures, and sputum cultures.

Health education is a responsibility of everyone employed in public health. Nurses consistently sell health to the patient and his family. Usually, one section of the department is designated to work specifically on education materials, to conduct panels and programs, to distribute health literature, show films, prepare news releases, and have individual conferences. A nutritionist may be employed to conduct clinics for homemakers to show them how to prepare well-balanced, inexpensive meals. She may work with nursing home personnel in planning menus.

Maternal, child, and school health services are mainly handled by the public health nurses. The nurses staff clinics and make house calls for families who are unable to pay for the full cost of medical care. Prenatal and postnatal cases receive special attention. Infants and preschoolers are examined and given needed immunization shots at the "well-baby" clinics. One annual report [2] revealed that about 17 per cent of more than 10,000 babies and preschoolers checked had a variety of abnormalities. Each nurse may have two or three schools in her district, working with the schools as needed. She makes house calls for sick school children. She assists school authorities with programs of health evaluation, with hearing and vision testing, and with immunization and tuberculin tests. Dental clinics for school children have been established in some areas. Most public health nursing staffs include a proportionate share of practical nurses.

Communicable disease control has been expanded to include chronic diseases. Health departments originated because of the need for control of communicable disease. The work remains an important phase of public health work. The numbers and kinds of illnesses (morbidity rates) are essential in public health work. Various means are used to find the illnesses. One method is to require reports of all communicable diseases, of all dog bites in areas where rabies has occurred. Mobile units are used to give survey chest x-rays. Tests are required of all foods handlers and public school teachers. Nurses assigned to communicable disease control help with immunizations against smallpox, diphtheria, whooping cough, tetanus, polio, scarlet fever, and typhoid fever. They teach isolation techniques, rehabilitation, and nursing care of the sick in the home.

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[2] Marion County General Hospital, Indianapolis, 1964.

Environmental sanitation involves some 60 to 70 per cent of the services rendered by local health departments in urban communities. Because the student practical nurse has little opportunity to learn elsewhere about the goals toward which the sanitarian strives, it is worthwhile to examine the different phases of environmental sanitation. This will be done in the following chapter.

QUESTIONS FOR DISCUSSION

1. Study the organization of your local health department.
2. Obtain a copy of the yearly report from your local health department. What was the leading cause of death? Were there more deaths or births? What illnesses occurred? Are these diseases increasing or decreasing in number: tuberculosis, syphilis, gonorrhea?
3. What opportunities exist in your community for employment of licensed practical nurses in public health? If possible, arrange for a public health nurse to tell the class about her work.
4. What contributions do practical nurses in your area make toward community health? Could they do more?

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Chapter 21

ENVIRONMENTAL SANITATION

An important professional person working in environmental health is the sanitarian. The sanitarian protects the public health by applying scientific knowledge to one or more aspects of the environment. His special area may be housing, food sanitation, or sewage disposal. Individual states set the requirements for the registered sanitarian. Usually he must have a college degree with forty hours in physical and biological sciences; two years of field experience; and pass a state board examination.

Housing

Housing is of public concern because poor, inadequate housing leads to slum conditions. Slum conditions help to spread disease, foster crime, and raise taxes. Of course, poor housing is not the only factor which causes slums. Replacement of slum housing by good housing does not solve all the problems. Unsanitary homes can be found in every part of a city in either poor or rich families. Poor families can have clean homes, yet run-down housing is indicative of poor conditions. It has been said that slums begin when the first broken window goes unrepaired. Dilapidated housing is a safety hazard. It harbors insects and rodents, both disease carriers. (Rats carry some eighty different diseases.)

The health department promotes desirable housing by establishing basic minimum standards; by issuing permits and licenses for construction of new housing only if the standards are met; and by enforcing building codes and housing ordinances. Included among building code provisions are guaranty of building strength, structural protection against fire, safe electric wiring, dependable heating equipment, proper ventilation, and adequate sanitary facilities.

When the sanitarian inspects multifamily dwellings or institutions, he notes if standards are met regarding the number of occupants per room; conditions of plumbing and roofing; sufficient bathing and toilet facilities; separation of cooking areas and drinking water supplies from the toilet and bathing areas; number and location of exits and fire escapes; adequate lighting in hallways; structural and interior repair; vermin and rodent infestation; ventilation; and general sanitation.

Both building and housing codes should be frequently revised.

Minimum housing standards are defined by ordinances. In the case of substandard housing, the sanitarian can condemn the house as unfit for human habitation and order it to be vacated. The sanitarian, however, works with the home owner or landlord to suggest repairs and encourage him to make the needed improvements. Only as a last resort does he take the case to court, to have the house ordered vacated. It is natural for a man to reason, "My home is my castle. I can do as I wish in my own home," but when his actions endanger the safety and welfare of others, it is not his business alone.

Water Supply

Clean, safe water has been available in unlimited amounts long enough for Americans to take it for granted. Modern methods of purifying water have been so well perfected that waterborne illnesses are rare. But water shortages and potential contamination of the water supplies have shocked and concerned enough people that remedial action has finally started—and none too soon.

The amount of water used in our country has increased tremendously because of a growing population and greater uses of water, such as the automatic washing machine, watering lawns, washing cars, and increased industrial uses. Growth and spread of urban and industrial communities bring closer together the sewage outfall of one community and the water intake of another downstream. At least 50 million people in the United States drink second-hand water.[1] (This is water that has been used to carry off wastes from one community and then "treated" to purify it for drinking water for another community.)

Water is also in great demand for recreational purposes and for irrigation projects. We shall consider here only the health aspects of the demand for water.

Water for rural, domestic use is almost always *groundwater*, whereas *surface water* is increasingly used by urban communities. *Groundwater* soaks through the porous soil and collects underground. Springs and wells tap the groundwater at its uppermost level, called the water table. Springs consist of groundwater that reaches the surface through a rock fissure or exposed porous soil. Wells are made by sinking a shaft into the ground to penetrate to the groundwater level. The water for springs and wells is purified as it filters through the layers of soil. Suspended particles, including microorganisms, are removed. Passing through 150 feet of soil (sometimes 100 feet) is usually sufficient to purify the water. This is why the driven well of 100 feet or more is more likely to be safe for drinking purposes than the dug well of 30 to 40 feet. In addition, the well must be carefully located and constructed to prevent contamination. Springs should be enclosed by water-tight walls and cover. For specific information on the location, construction, and operation of private water facilities, the home owner should consult the local health department. Any water of questionable source should be bacteriologically tested before using.

Surface water collects in lakes, streams, ponds, and rivers. Its purity ranges from that of a polluted city harbor to a sparkling mountain stream. Regardless of appearance, surface water should not be used for drinking unless purified. Most communities use surface water because it is more readily available and make it safe by purification processes.

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[1] *U.S. News and World Report,* September 20, 1965.

In making surface water safe for human consumption and use, the principal operations of a municipal water-purification plant are sedimentation, filtration, and chlorination.

The water is stored in large sedimentation basins (often of a capacity of 1 million gallons) and clarified by sedimentation or settling out. Sometimes alum and lime are added to hasten the process and remove vegetable colors. The water then flows onto a filter bed consisting of layers of sand built up over layers of gravel and crushed rock. This may be 6 feet thick. The filtering process removes bits of wood, fibers, minute plants, and animals, and some microorganisms. Under the gravel are drains which carry the filtered water to storage cisterns where chlorine (usually in the form of gas) is added. The chlorine destroys any bacteria that may still be present. If the water is severely contaminated, chlorine may be added both before and after filtration. Purification processes may also include removing minerals to soften the water and adding fluoride to aid in the control of dental caries.

The safety of a public water supply is constantly checked by the community's public health department. A sanitary survey by a qualified engineer or sanitarian includes inspection of the source of raw water and its condition, operation of water-purification plant, and mechanics for distributing water to its consumers. Chemical analysis and bacteriological tests indicate if the water is polluted and disclose when emergency action is needed.

Epidemics of typhoid, hepatitis, amebic dysentery, or cholera can occur if the water systems ever break down. One main concern in a disaster is the possible contamination of the normal water supply.

WATER POLLUTION

The word *pollution* means the introduction of any substance that is not a natural and normal component of water. So many new and complex waste materials are finding their way into the rivers, lakes, and harbors that any non-normal waste, such as sugar, is now called a pollutant.

It has been noted that nature itself, with its fine system of checks and balances, has a way of causing a river or stream to cleanse itself of pollution. Through dilution, biological action, and oxidation, the products of natural life which enter the waters are absorbed and rendered harmless.

Problems have arisen because of the abnormal amount of organic wastes and the significant quantities of unnatural wastes that have been poured into the rivers, harbors, and lakes. Man has dumped into the waters an overabundance of waste products, too many detergents, industrial chemicals, insecticides, and radioactive materials. Nature's way of cleansing the waters is no longer adequate; the burden of waste is too great.

Waste Disposal

The task of collecting, treating, and disposing of the wastes from today's metropolitan and industrial areas has been overtaxing the water resources. Many agencies and legislative bodies have come to the support and aid of the health departments, and new, improved methods are being developed.

The local health department has always been concerned about the handling of wastes because all waste material is a possible source of disease. Particularly, human excreta is a source of danger because of the pathogenic microorganisms it contains. Insects and rodents can pick up the pathogens and return them to man via food, water, or other routes.

Any one of several agencies of the local government may be given the responsibility of disposing of wastes, but the local health department has powers of inspection. In most cities a sanitary commission or department manages the sewerage.

Sewage, 99 per cent water, contains everything that goes down the drains of a city or town—the used water from toilets, bathtubs, and sinks; washings from restaurants, laundries, hospitals, hotels, and other operations. It may contain industrial wastes such as acids, chemicals, oils, grease, and animal and vegetable matter discharged by the factories. (*Sewage* refers to the liquid wastes; *sewer* refers to the pipes; and *sewerage* indicates the complete system, including the treatment plant.) The sewage, a mass of pollution, should flow into a treatment plant before it is returned to the river or stream. Unfortunately, in many cities sewage is discharged directly into a river, lake, or stream. The sewage pollutes the water, makes bathing unsafe, causes fish to disappear, produces odors, and creates various health problems. Some streams become merely open sewers because of the untreated sewage. Because of this situation, federal legislation has been enacted, the Water Pollution Bill becoming effective October 2, 1965. Industries and municipalities have been given recommendations for water purification. The response has been good in many areas of the country, such as that surrounding the lower end of Lake Michigan. The waters of Lake Michigan were made safe for water sports by the summer of 1966. The steel and oil industries of the area agreed to antipollution controls and to free the water from industrial contamination by December 1968.

Municipal sewage treatment plants cost money to build and operate; industry has to spend money to treat the waste products. These are essential to protect health, agriculture, industry, and recreation for our entire country and for future generations.

In treating sewage the principal operations of a municipal sewage plant are screening, settling or sedimentation, filtration, oxidation, and chlorination.

As the sewage water enters the plant, it passes through screens which remove large solid objects, such as sticks and rags. Then it flows slowly through large tanks, where it stands for a considerable time. The solid material is slowly decomposed through the action of microbial enzymes. The solids sink to the bottom as "sludge" or rise to the top as "scum." The water between these two layers is drained off. The sludge is pumped out, and is often used for garden fertilizer. Any typhoid, dysentery, or cholera organisms present are killed in the process. Sometimes the water is returned to the waterway without further purification.

If further treatment of sewage is needed, the liquid is drained through a special bed of coarse stones about 6 feet deep. Filtration and oxidation occur simultaneously. Bacteria grow on the stones, and the action of the bacteria on the solids render the sewage harmless. Sometimes the sewage is placed in aeration tanks where special types of bacteria oxidize the organic matter into harmless substances. The remaining liquid drains through the filtering bed. A final chlorine treatment to disinfect represents the safest method of disposal.

A typical municipality has sixty to seventy sewage plants, ranging from simple to complex. For example, an oxidation pond is a kind of sewage treatment utilizing aerobic bacteria to render sewage harmless. Results from properly planned oxidation ponds have been satisfactory.

In areas with no city sewers but with piped water available, septic tanks are used. A septic tank is a watertight settling tank located underground, into which the sewage from one house flows. A biological process is involved in which the organic waste matter is decomposed by action of anaerobic bacteria. The large solids settle to the bottom and accumulate as sludge. This sludge must be removed every two or three years. Partially treated sewage or effluent flows out from the tank into the ground still containing large numbers of harmful bacteria and finely divided organic matter in suspension. A subsurface soil-absorbent system such as the finger system or underground leaching will finally dispose of the effluent. Septic tanks for individual homes are being replaced by sewerage as communities increase the services available to all residents. (See Figure 21–1.)

The term *refuse* applies to the solid waste materials, the ashes, rubbish, and garbage discarded by people. The amount of garbage collected seems to be decreasing because of the packaged foods now available in groceries and the installation of garbage grinders in the home. With a home disposal unit, the garbage is washed down the drain into the sewer and taken to the sewage

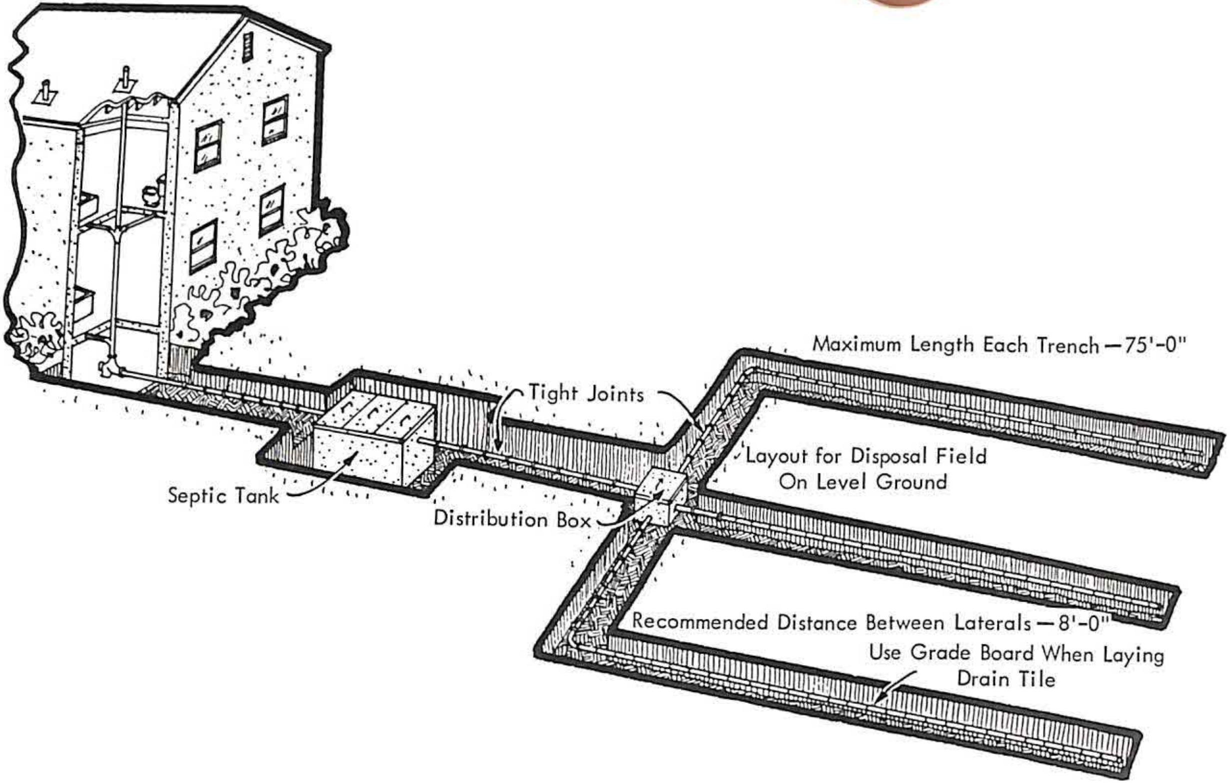
Maximum Length Each Trench—75'-0"
Tight Joints
Layout for Disposal Field On Level Ground
Septic Tank
Distribution Box
Recommended Distance Between Laterals—8'-0"
Use Grade Board When Laying Drain Tile

Figure 21–1. A septic tank needs considerable area to operate efficiently. If the drain field is too close to other drain fields or to shallow water supplies, there is danger of disease. (From *Florida Health Notes*, Vol. 55, No. 1, January 1963. By permission of *Florida Health Notes*.)

treatment plant. A city's sewerage system has to be able to handle the increase.

The quantities of trash, rubbish, and ashes discarded seem to be increasing. One sanitary commissioner estimated that the amount of cans, paper, and plastic collected increased more than fifty per cent in one ten-year period.

Methods employed in different cities to dispose of refuse include incineration, sanitary landfill, open dump, and composting.

The open dump is a cheap but highly undesirable method of disposing of refuse. Not only does it give off objectionable smoke and odors, but it is a breeding place for rats, flies, and mosquitoes. These vermin are capable of carrying disease to man, hence are a serious threat to residents of near-by areas. Open dumps are gradually being replaced by more healthful methods of disposing of waste materials.

Garbage composting has been used for many years in Europe and Asia, but has largely been experimental in the United States. Composting is a biological process in which the material is shredded or ground, then processed under anaerobic or aerobic conditions.

Sanitary landfill and incineration are two of the more acceptable and satisfactory methods of refuse disposal. Incineration is destruction of refuse by burning. The new incineration plants are architecturally pleasing, handle mixed refuse containing both garbage and rubbish, and can be maintained in a clean and sanitary condition. All burnable trash is reduced to an ash that has no odor and can be used for fill. Nonflammable metal items are separated, and can be packaged and sold to scrap dealers. Some items cannot be burned or sold for scrap, such as porcelain refrigerators, hence some dumping is needed.

The sanitary landfill is a type of dump, but one that eliminates the health hazards if it is properly designed, located, and operated. Garbage and trash are placed in pits in the ground, and a heavy machine or bulldozer is rolled over the refuse to compact it into a smaller mass. It is then covered with two feet of compacted earth. The process is repeated until the pit is level with the surrounding area. The system permits unusable land to be reclaimed for recreation, parking areas, or other uses. In areas where the land is flat, a trench about 6 feet is opened for each day's dumping. At the end of the day a parallel trench is dug and the excavated dirt put on top of the rubble. When dumping and compacting are completed, about two feet of dirt is added. The sanitary landfill requires approximately one acre of land yearly for each 10,000 inhabitants. In areas where land is at a premium this method may not be practicable.

Home storage of garbage and trash was discussed earlier. Competent handling of garbage and trash by the homeowner and by the city sanitation department result in the greatest health benefits for the entire community.

Public Pools

Public swimming and wading pools are under constant surveillance by the health department. Lukewarm water is a potential media for the growth of germs. Man is not by nature an aquatic animal and the body openings must be protected from disease germs. If a person with a boil or ulcer goes swimming in the pool, the "staph" bacteria are washed off in the water and can be picked up by another swimmer. Many viruses and bacteria can live for long periods of time in untreated water, and diseases spread by discharges from the nose, mouth and intestinal tract are potential dangers to swimmers. Because swimming is a strenuous exercise, swimmers become fatigued and their resistance to disease germs is lowered.

During the swimming season, public or semipublic pools are often checked weekly by the sanitarian. (In more crowded pools the checks may be made daily.) On-the-spot checks are made for general safety conditions and chlorine residual, and laboratory tests for bacteria content.

Drinking water requires enough chlorine to be added to it to provide 0.1 to 0.2 ppm (parts per million) excess of chlorine, and swimming pool water requires 0.5 ppm excess level to be maintained for adequate purification.[2] Water that is murky, dark, and cloudy is usually unsafe. Clear water is likely to be clean water. The water should be changed frequently and filtering should take place if the water is recirculated.

Homeowners with private pools have the responsibility of maintaining a healthy swimming pool. The water should be changed or recirculated frequently. Inexpensive testing kits may be purchased which utilize a simple system of color comparison to indicate the water's condition.

Milk Supply

The milk supply must be handled carefully because milk is highly perishable and easily contaminated. It is a staple food for people of all ages, hence a transmitted disease could become epidemic. Milk is always a potential hazard because it furnishes a good media for bacteria growth and dirt is unnoticed in the nonclear liquid. Milk can transmit the pathogens of amebic dysentery, bacillary dysentery, typhoid fever, undulant fever, tuberculosis, diphtheria, scarlet fever, and septic sore throat. The bovine tuberculosis organism is particularly tough and virulent. The milk can become contaminated from an infected cow, unclean equipment, infected dairy personnel, or poor storage of milk and dairy products. The local health department inspects all phases of milk production and requires proof that workmen are healthy.

Tremendous improvements have occurred within the dairy industry during recent years. Milk will stay sweet in the refrigerator for seven to ten days or longer, not merely two or three days, because the milk is clean and has a low bacteria count.

Every stage of milk production is carefully controlled. The herds are tested for disease and dairy barns are kept clean. The cows are milked by machine, and the milk flows into stainless steel bulk tanks and is cooled immediately. From the refrigerated tanks, the milk is taken by refrigerated truck to the dairy to be pasteurized. Low temperatures are maintained to inhibit bacteria growth. Only clean equipment comes in contact with the milk. Methods of pasteurization have been improved. Milk is not exposed to daylight until it is poured into the glass for drinking. Proper handling of milk includes bottling, capping, and delivery.

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[2] Hugh Rodman Leaval and E. Gurney Clark, *Preventive Medicine for the Doctor in His Community* (New York: McGraw-Hill Book Company, 1965), p. 541.

The dairy producers are willing to spend money to buy the equipment for these improvements because the public health measures are of profit to them. Similarly, if you, as a nurse, can convince a person that good health practices will benefit him personally, he may be willing to heed your advice.

Nearly all urban areas have ordinances stating that milk sold to people for fresh consumption must be pasteurized. Most cities have adapted the U.S. Public Health Service Milk Ordinance and Code. Cities with adequate health departments send inspectors to all dairies that sell milk within the city. The sanitarians responsible for controlling the quality of milk check for the butterfat content, delivery temperature, sediment (indicating cleanliness), and adequacy of pasteurization. Samples of milk from both farms and dairies are sent routinely to the laboratories for testing. The laboratory technician tests to see that the bacteria count is within the margin of safety and may also check for the presence of antibodies and pesticides.

Food Sanitation

Food sanitarians inspect restaurants, grocery stores, bakeries, butcher shops, vegetable and fruit markets, lunch wagons, and food-dispensing machines. Food as a source of infection has not been as well controlled as water or milk.

Earlier we discussed diseases that can be transmitted by food, the need for proper refrigeration and heating of food, and the reasons for good dishwashing techniques. It is in public eating places and food stores that pathogens are most likely to be transferred from the sick person (or carrier) to the healthy person.

When the sanitarian inspects a restaurant, he is noting general cleanliness, habits of employees, and storage of food. The storage facilities for food must be clean and free from vermin. Food handlers must be healthy and should practice good personal cleanliness at all times. Regulations to keep the food safe include keeping hot foods hot, and cold foods cold; protecting the food from respiratory contamination in handling, from dust, insects, and adulteration; and using sanitary dishwashing methods. (See Figures 21–2 and 21–3.)

Local ordinances specify that public and semipublic eating places must meet certain requirements in order to be licensed. The local health officer licenses and issues permits. He can close down eating places that do not meet the standards, but he first works with the owner-operator to help improve the situation. The modern operator of a restaurant, bar, or hotel usually recognizes that his livelihood depends upon preventing foodborne infections, hence he cooperates with the sanitarian. He encourages his employees to have periodic physical examinations and to attend food handler training courses given by the health department. Instructing employees has proved to be effective in maintaining high standards in restaurant operations. The health officer also works with kitchen personnel of public schools, nursing homes, and institutions serving food.

Unclean conditions are sometimes found in temporary, mobile restaurants such as food booths at local or state fairs. Some states have passed laws that prohibit serving home-prepared foods to the public in schools, hospitals, and nursing homes, or by civic and religious organizations, because state and local health authorities have no jurisdiction over foods so prepared for public consumption. The law does not permit the sanitarian to enter private homes without a search warrant.

The nurse can help people to realize that although the health laws are good, they have limited effectiveness. The controls are still imperfect and there are too few enforcers. One should avoid a restaurant or market that does not appear clean and well kept. Ordinary cleanliness is important.

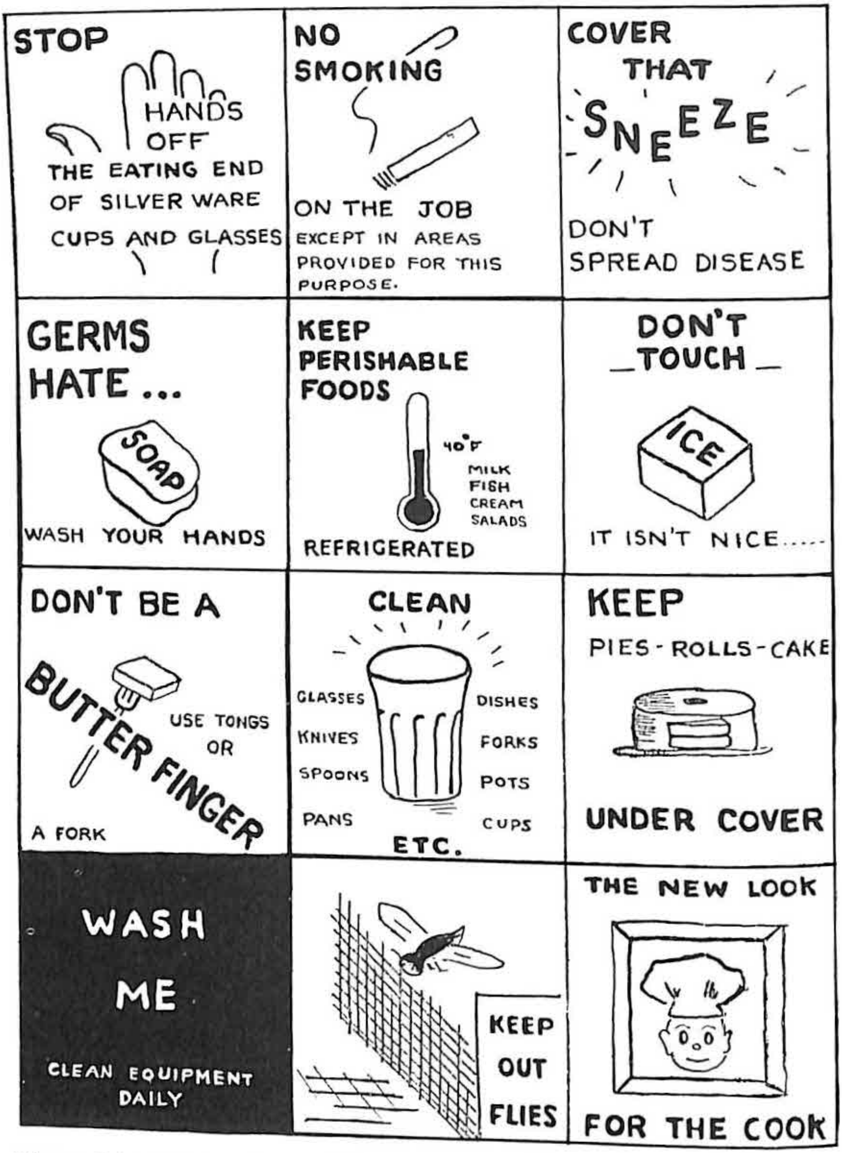

Figure 21–2. Poster for food handlers. (By permission of Indiana State Board of Health, Indianapolis.)

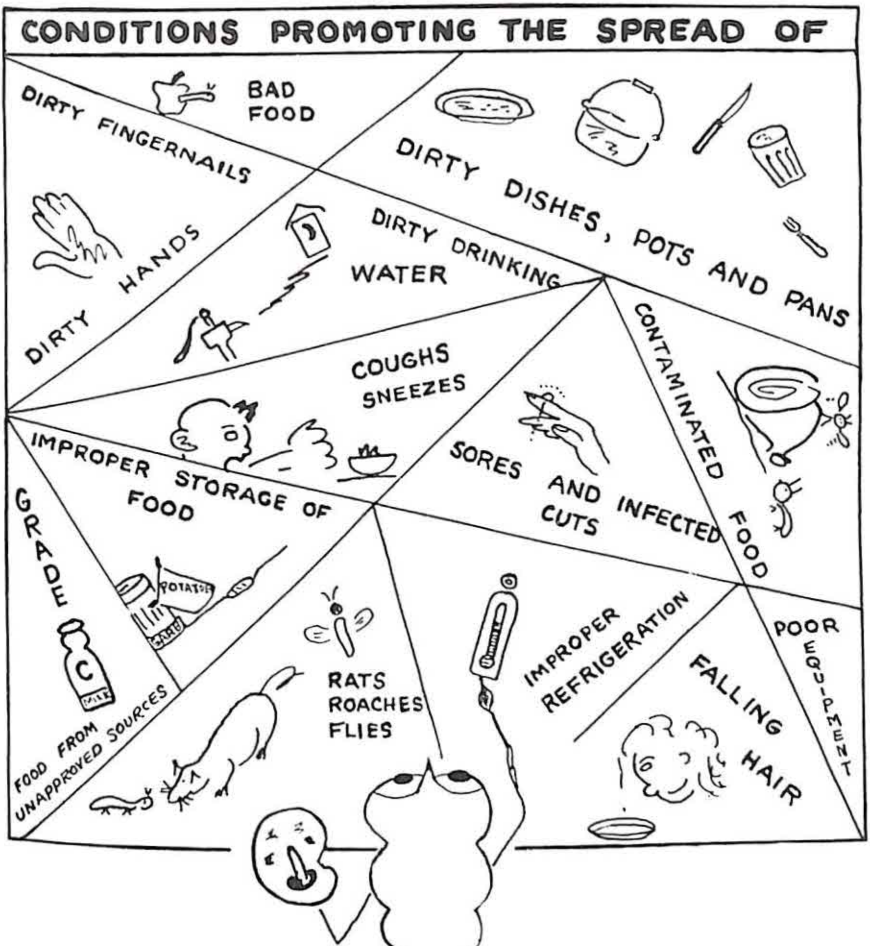

Figure 21–3. Poster for food handlers. Developed by Indiana State Board of Health for a course of instruction in food handling. (By permission of Indiana State Board of Health, Indianapolis.)

Meat Inspection

Meat-packing houses and handling of meat merit continuous attention from the local health department. The buying public should be protected from meat that is prepared under unsanitary conditions, carries disease, or is adulterated.

Meats intended for interstate commerce or for export are inspected by the Bureau of Animal Industry of the U.S. Department of Agriculture. Meat to be sold locally is inspected by the state or local health department.

In large meat-packing houses, a veterinarian or sanitarian inspects the animal before and after it is slaughtered. The live animal is inspected to see that it is free from such diseases as tuberculosis, anthrax, and trichinosis. Later inspections of the meat are to assure that the meat will be cooled immediately, that the process of slaughtering is handled correctly, and that the meat does not become decomposed or infected. Inspections of meat at various distribution points ensure proper handling and storage, and that contamination and deterioration do not take place.

In some areas without an active local health department, slaughter houses may be inspected only once a year by a state inspector. The rest of the year, meat packers sell meat that has not been inspected or approved. Areas with an active local health department provide for inspection of all slaughter houses. All meat that is sold over the counter or served in a hospital, restaurant, or nursing home must have a stamp of approval—federal, state or local. This may also include inspection of poultry and fish markets, according to local regulations and inspection practices.

Vector Control

Pest control is one of the most important aspects of environmental health. The relationship of vectors and the spread of disease to humans was discussed in Chapter 15. An ideal control situation reduces disease-carrying pests like flies, mosquitoes, and rodents to such a low level that they do not endanger the health of the community. This requires cooperation from the individual citizen and all units of the local government, including the health department. A poorly managed drainage ditch can be a breeding place for mosquitoes. Flies multiply in rubbish and garbage dumps and in improperly stored garbage around homes. Open dumps can cause an increase in the rat population. Activities of the local health department might be to eliminate all mosquito breeding places; improve drainage ditch programs; eliminate existing open dumps; clean up vacant lots; enforce housing codes to eliminate privies; enforce sanitary ordinances regarding garbage collection, storage and disposal; work with commercial pest control operators; and inform the people why they should cooperate. Ordinances alone will not guarantee sanitation.

School Building Inspection

Public and private schools are often inspected biannually by the local health department. School buildings are checked for proper ventilation, safety factors both inside and out, overcrowding, toilet facilities, a minimum of 30 footcandles of light, general sanitation, proper heating, adequate refuse disposal, and an ample supply of pure water dispensed by fountains that are properly used and maintained. School lunch programs are inspected a minimum of every three months, more often if needed. Sanitarians note the cleanliness of equipment and utensils, refrigeration, and personal hygiene of employees. Sanitarians also provide the professional check of proposed sites for new public schools and for new school buildings or additions to existing ones.

Health Facilities

Nursing homes are licensed by the state board of health upon recommendations of the local health board, if there is one. Otherwise, the state personnel inspect the homes. The medicare legislation has created great interest in nursing homes.

The laws concerning the licensing of nursing homes have been broadened in most states to include all health facilities—boarding homes as well as nursing homes. A state license is often required for any home or institution giving treatment longer than twenty-four hours to two or more unrelated individuals needing care by reason of infirmity or age.

The sanitarian from the local health department generally visits each nursing home every two months. He works with the operator to help him maintain a clean home. The inspections are to note the food service and food handling, safety features, fire prevention, lighting, ventilation, arrangement of rooms, bed spacing, provisions for privacy, lounge area, accommodations for disturbed patients, toilet and bathing facilities, water supply and sewage disposal, and provisions for laundry. Usually a nurse from the state health department inspects the type of nursing care given, drug handling, and records kept.

Mobile Housing

Mobile homes and trailer parks should not be neglected by the city or county health department. The ten per cent of the population who live in mobile homes need the same protection as those living in permanent housing to ensure clean water, sewage disposal, garbage and trash pick-up, and reasonably pure air.

Air Pollution

Air pollution has always been present to a degree, but its increase since World War II presents many problems. City residents complain that the air they breathe smells bad, soils clothes, tarnishes metal, ruins paint, kills crops on farms miles away, and plays a role in serious illnesses of the heart, lungs, and circulatory system.

Air pollution has worsened in cities where the smog gets thicker and affects a greater area and more people as traffic and industry expand. A bigger city means more buildings to heat and more wastes for disposal. There are more automobiles, trucks, and buses to pour fumes into the air. More industrial plants and new products create chemical fumes and smoke. Other prominent causes of air pollution are smoke and dust from city dumps and smoke from an increased number of power-generating plants. The "urban renewal projects" contribute to air pollution with the sandblasting of buildings, demolition of old buildings, and construction of new interstate highways.

The effects of air pollution upon health are difficult to measure. There are several known episodes where acute illness and death have resulted from the heavy concentration of pollution because of unusual weather conditions. In 1948, twenty deaths and hundreds of illnesses occurred when a smog blanketed Donora, Pennsylvania, for several days. A London fog caused some 4,000 deaths in 1952. The deaths were among persons suffering from respiratory, cardiac, or circulatory disorders, many in the older age group. It is believed that pollution aggravates or intensifies the illness of people already suffering from a variety of chronic diseases. In addition, air pollution acts upon exposed mucous membranes, causing eye, throat, and nasal irritations. Such irritations combined with the general nuisance effects of air pollution can produce emotional harm to the people living in these areas.

Air pollution is likely to increase unless preventive action is taken. Congressional action in October, 1965, enabled the Public Health Service to propose regulations requiring that all new cars be equipped with exhaust-control devices. California law requires that by 1970 new automobiles have effective exhaust-control equipment. In Florida, gasoline-powered vehicles (primarily automobiles) emit 86 per cent of the total air pollution.[3] Hence reducing the pollution from automobile exhausts is a primary element in reducing air pollution.

Most major industrial corporations now install antipollution equipment as they build new plants, even though it is not specifically required by law. Some state legislatures have voted to allow personal property tax exemptions for industrial equipment used to prevent air pollution, thus making it less expensive for industries to cooperate.

Local government units can help to lower contamination by discontinuing all open dump burning of trash and by providing adequate zoning for new industries.

The individual citizen can help to reduce air pollution in several ways. He can let the legislature know that he supports a program for the prevention of pollution, because such programs cost money. (It has been concluded that available methods for measuring air pollution have been more than adequately developed and what is now needed is to implement the control programs.)[4] The citizen can refrain from burning trash on his premises. He can have his home heating plant cleaned and adjusted as needed. (The proper method of firing coal furnaces can remove soot from the air.) He can keep the motor in his automobile in good adjustment and repair to avoid excessive burning of oil and gasoline.

Role of Practical Nurse

The discussions in this chapter are not meant to lead you, the student practical nurse, to believe that you must be an authority on each topic. The health officer in your community is a highly trained person, as are the sanitarians and engineers actively working to maintain good community sanitation.

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[3] *Florida Health Notes* (December 1965), p. 205.

[4] J. M. Ellison, "Methods for Measurement of Air Pollution," *Bulletin of WHO*, Vol. 32 (1965), pp. 39–409.

But as a practical nurse, you must appreciate the problems involved in environmental health, and know how the health department works toward solutions. Then you can adequately support fellow health workers.

Passing ordinances does not guarantee good community sanitation. Only when the people in a community want to cooperate are results achieved. The practical nurse who understands the need for public health regulations can support them wholeheartedly and help to convince others that they should do the same. Your family, friends, and neighbors will note if you, a nurse, take time to wrap garbage before disposing of it; if you follow health board regulations when helping with a church dinner; if you shower before entering the public pool to swim (or insist that your children shower); if you keep your home in good repair; and if you support legislative action to control water and air pollution. By your actions, as an individual and as a nurse, you can help to improve health in your community.

QUESTIONS FOR DISCUSSION

1. What is the source of water in your community? What provisions are made for disposing of wastes, rubbish, and garbage?
2. If time permits, plan a field trip to either the water company or sewage disposal plant.
3. Arrange for a sanitarian from the local health department to talk to the class about the environmental health problems in your community and what is being done. What are state and local regulations regarding water and air pollution? Where is the substandard housing? What pest control problems exist?
4. Learn about the specific regulations in your community regarding restaurant sanitation, meat supply, dairy in-

dustry, housing code, public swimming pools, and mobile housing.

5. What are the laws in your area regarding nursing homes? Read the requirements for licensing a nursing home. Who inspects, and how often?

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Chapter 22

VOLUNTARY HEALTH AGENCIES

Voluntary health agencies have made tremendous contributions to improving the health of the general public by educating people about the causes and prevention of certain diseases. Government work has been encouraged and research stimulated by them. If you, as a practical nurse, are to give maximum service to your patient, you should understand the functions of the voluntary agencies. You should also be aware of the responsibilities these agencies have to the public and the need for continual evaluation of their role in the total health picture.

Voluntary and Official Agencies

Voluntary health organizations should support and supplement the work of the official agencies. Voluntary agencies differ from official agencies, which are part of the government and supported by tax dollars. The official agencies are responsible for enforcing the public health laws. We have discussed the U.S. Public Health Service, the Food and Drug Administration, the state health departments, and the local health departments. These are public, official agencies.

Each voluntary health agency was organized by a group of people endeavoring to solve a specific health problem. The leaders established policies, planned the operation of the organization, and designated means of securing financial support.

Financial support comes from donations, contributions, grants, bequests, and dues. You are familiar with the Christmas Seal sales for the National Tuberculosis Association, the yearly fund drive to support the American Red Cross, and the March of Dimes for the National Foundation. When fund raising is accomplished by a community chest or united fund drive, the money collected is distributed to various agencies. Volunteer work is essential to these organizations, but usually staff members are full-time employees. All but the very smallest agencies operate with a paid staff.

Types of Voluntary Health Agencies

Some voluntary agencies were founded to combat a specific disease. Their funds are used primarily for health education, professional education, research, and, in some instances, medical care. Three examples include the American Cancer Society, the National Tuberculosis Association, and the National Hemophilia Foundation. Other agencies are interested in a specific organ or function, such as the American Heart Association, the American Hearing Society, and the National Society for the Prevention of Blindness. Certain agencies were formed to promote the health of special groups, such as the American Child Health Association, the Maternity Center Association, and the Association for the Aid of Crippled Children. Agencies interested in specific phases of health are the Planned Parenthood Federation of America and the National Safety Council.

The First Voluntary Organizations

The voluntary health organizations that developed in the early 1900's were part of the social reform movement. Historical accounts of the 1890's and the early 1900's reveal the eruption of complex social problems. The fruits of the workingman's labors had gone to amass huge fortunes for a few people, and a great majority of Americans lived in poverty, unable to buy the products they helped to produce. Writers, legislators, farmers and social workers were among those who rebelled against the great difference between American reality and the American dream.[1]

The voluntary health agencies called attention to afflictions which often were caused or worsened by poverty and neglect. Thus the activities of the health volunteer of that era enhanced the basic goal of the reformers: to call attention to variances between what the United States could be and what it actually was.

Tuberculosis was a leading cause of death, but despite Robert Koch's announcement in 1882 that he had isolated the tubercle bacillus causing the disease, the news made little impact upon the medical practice of the time. Koch had not produced an effective antituberculosis vaccine, nor had he suggested a weapon to combat the disease. Lawrence F. Flick of Philadelphia, an arrested tuberculosis case, was amazed at the general public's lack of knowledge about the disease and the slowness of the official agencies and medical people to act. In 1892 he gathered lay and professional people together and organized them for the purpose of conquering the disease. They formed the Pennsylvania Society for the Prevention of Tuberculosis, the first voluntary health agency in the United States. Later, Flick persuaded Henry Phipps to establish the Phipps Institute, the country's first institute for tuberculosis research.

Others besides Flick were able to make use of Koch's discovery to prevent transmission of the tubercle bacilli from one person to another, to promote isolation of patients, and to foster hygiene in homes and factories.

Dr. Hermann M. Biggs, a New York health officer, fought for and won the requirement that all tuberculosis cases be registered. Dr. S. Adolphus Knopf, another New York physician, wrote articles urging cooperation of government, physicians, and the public in controlling "consumptive" diseases.

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[1] Richard Carter, *The Gentle Legions* (Garden City, N.Y.: Doubleday, 1961), pp. 21–27.

Dr. Edward L. Trudeau, himself a victim of tuberculosis, formed the first semicharitable sanatorium in the United States in 1884 at Saranac Lake, New York.

Tuberculosis was still the leading cause of death in 1904, and the time was right to establish a national organization to combat the disease. Leaders of the various factions met and formed the National Association for the Study and Prevention of Tuberculosis, later to be known as the National Tuberculosis Association. Despite differences, the founders readily agreed on basic objectives, the objectives of Flick, Biggs, and Trudeau. Edward L. Trudeau was elected the first president, and in his address at the first annual convention, he said, "The first and greatest need is education; education of the people, and through them education of the state."

The basic objective was to make it known that tuberculosis was contagious and could be avoided. The organization is credited with being a major influence in reducing the death rate from tuberculosis and bringing about modern control methods.

Later, the National Tuberculosis Association, with financial assistance from the Metropolitan Life Insurance Company, demonstrated the possible benefit to a community when all the available knowledge about tuberculosis was practiced. The town of Framingham, Massachusetts, was selected for the project because its size, economy, social structure, and tuberculosis death rate were similar to nearby communities with which it could be compared before and after the tuberculosis project. The project began in 1916. Every resident in the community was examined periodically. Isolation and treatment of tuberculosis patients began immediately. General health measures were followed, such as infant health clinics and pasteurization of milk. During the six years of the project, the tuberculosis death rate dropped 68 per cent as contrasted to a 32 per cent drop in communities lacking control. The National Tuberculosis Association's platform of prompt case-finding, adequate treatment, and better hygiene was now proved scientifically. Other similar projects have been initiated by voluntary agencies not bound by the legal regulations of the official agencies, hence free to inaugurate new methods.

Original Functions

The current strength of voluntary health agencies may be traced to their original leadership in education, demonstration of methods of problem solving, promotion of legislation, encouragement to research, and efficient services.

Because they are not impeded by official restrictions, voluntary groups can help to promote new, sound health legislation. Each agency represents large numbers of voters; therefore, it can be more influential than the small staff of the public agency.

Some voluntary agencies offer direct patient services. Frequently, their help supplements services provided by government agencies that may be limited by funds, legislation, or policy.

Voluntary agencies long have been called "watchdogs" of the official agencies, safeguarding the interests of the citizens in health. They have supported official health departments by working for the appointment of well-qualified people and by helping health officers to secure funds. They have criticized when necessary.

A basic function of the voluntary agency is to serve as an outlet for people who wish to help their fellow men with gifts of time and money. By working with such agencies, interested people can participate personally in community activities. Many dedicated volunteers report that by working to improve the health of the public, they find fulfillment in their own lives. It has been argued that,[2] "except for the desegregation movement, health voluntarism stands virtually alone nowadays as a means whereby millions of Americans can assemble for direct action against an array of national problems." Others [3] contend that it is essential to the democratic way of life that some of the health and welfare services be conducted and supported by citizens on a highly voluntary basis.

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[2] *Ibid.*, pp. 19–20.

[3] Harold S. Diehl, *Healthful Living* (New York: McGraw-Hill, 1964), p. 491.

Agencies Are Big Business

Voluntary agencies have become big business in the United States. They have benefited from the increased charity of the American public. In 1958, philanthropic giving for health and welfare purposes amounted to two billion dollars, with the voluntary agencies receiving $1.5 billion of this. It is expected that by 1970, the voluntary agencies will receive $2.7 billion annually from such contributions.

Contrary to popular opinion, the largest share of contributed funds come from living persons. The average American gave 2 per cent of his income after taxes in 1958.[4]

The general public is now solicited for contributions from more than 100,000 voluntary health and welfare agencies, plus another 100,000 fraternal, civic, veteran, and related organizations, and many of the 300,000 churches which offer various health and welfare services.

National and regional voluntary agencies whose primary purpose is health and welfare increased from fifteen in 1940, to approximately 100 in 1960. United funds and community chests throughout the United States have expanded from 549 in 1940 to over 2,000 in 1960, and now contribute to the budgets of over 26,000 local, regional, and national member agencies.

Responsibility to the Public

Because voluntary agencies derive support primarily from the public, they have a duty to the public to make accurate disclosures of income, expenditures, and services rendered. Every agency has the responsibility to be objective in reporting to the public the purpose of the agency, program content, administration, physical facilities, board structure and function, personnel, financing, budgeting, and relations with other agencies and the community.

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[4] Robert H. Hamlin, *Voluntary Health and Welfare Agencies in the United States* (New York: The Schoolmasters' Press, 1961).

It is the duty of voluntary agencies to cooperate with government agencies, not to compete or to duplicate services. In the last three decades, the government health and welfare programs have grown tremendously. Many functions once performed largely by voluntary agencies are now assumed, at least in part, by government. Staff members of voluntary agencies should be willing to re-evaluate activities and to be flexible in altering programs.

An example of flexibility is demonstrated by the Liberty Mutual Insurance Company and its rehabilitation centers. Many years ago the company initiated a rehabilitation program for the benefit of its compensation policy holders. They established one of the first rehabilitation centers, pioneered new methods in rehabilitation, and helped to prove the merits of rehabilitation. Now that local rehabilitation facilities are adequate, Liberty Mutual's rehabilitation activity has been decreased with the discontinuation of one of its two rehabilitation centers. Voluntary agencies should be willing to make similar assessments of the need for the services they offer.

The Future for Voluntary Agencies

A potential source of new funds for the voluntary agencies would be the purchase of personal services by the government. The government agency frequently has the choice of providing direct services to the citizen or of purchasing the services through a voluntary agency. In Europe, voluntary agencies are strongest in countries where they perform extensive services at government expense. Of course, the voluntary agency must provide efficient service. Nursing services have been purchased by local health departments from the community's visiting nurse association. The government has paid for rehabilitation services from Goodwill Industries, another voluntary organization.

Regulation of voluntary agencies by the government probably will increase. Many states now have laws controlling fund-raising by requiring licensing or registration for solicitation and by requiring filing of financial reports.

There is a definite need for a system of uniform accounting and financial reporting that will give the public an accurate picture of the voluntary agencies. If possible, a standardized method of reporting agency program activities should be developed. Although many contributions or services cannot be measured statistically, there are some that can be. Voluntary nursing associations have standardized reporting such as time required per case, number of cases, and cost per case.

Consolidation of agencies should take place when possible and feasible. Hamlin believes that 100,000 voluntary agencies are not needed to provide health and welfare services in the United States and that a better job could be done by a smaller number of consolidated units and agencies.

Current Important Functions

All voluntary agencies . . . must exhibit greater joint action and strengthen participation in community planning if they are to fulfill these important functions:

1. Determine new methods to improve health and welfare of the American people.
2. Demonstrate practical means by which these improvements may be made by both voluntary and government agencies.
3. Inform the general public and professions.
4. Supplement government programs with personnel, facilities, and services.
5. Protect the public interest by working for effective government agencies.

6. Develop comprehensive, balanced community health and welfare programs.
7. Promote and maintain legislation in the public interest.
8. Support research into cause of disease, deprivation, and inadequate services.

> This is a crucial period in the history of voluntary agencies. Wasteful competition, if permitted to continue, may well turn the focus of public demand even more toward government.[5]

Voluntary agencies need to continue the tremendous leadership they have fostered in the past. This will require imagination and courage—courage to discontinue past activities and imagination to conceive and plan new ventures.

As a practical nurse, make an effort to learn the services offered and the educational work of the voluntary health agencies in your community. Give them your support. Participate in and be ready for changes that will surely come.

QUESTIONS FOR DISCUSSION

1. How are contributions made to voluntary agencies in your community? Explain the workings of the United Fund Drive (if there is one).
2. Read the history of one voluntary health agency.
3. Is there any significant area of public health in your community that is not covered by existing agencies?
4. Should your community have more or fewer voluntary agencies?

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[5] *Ibid.*

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Chapter 23

FUTURE FOR THE PRACTICAL NURSE

Comprehensive patient care has developed into five phases: acute or intensive, regular nursing, ambulatory, nursing home, and home care. All five phases of patient care are hospital centered.

A tremendous change is currently taking place in the nature of medical treatment and the method of administering it. What are the roles of all the different medical technicians, nurses, and medical specialists? Where does the practical nurse fit into the overall picture of nursing?

The key is for each occupation to find a position in administering medical care. If each person knows his position, the better for the overall picture of medicine. The division of work is not important as long as the patient and the community benefit.

Sufficient knowledge of the other disciplines to be able to work well with them is important. The practical nurse should be familiar with other disciplines such as nutrition, medicine, physical therapy, occupational therapy, and sanitation.

The practical nurse is a part of the change taking place. She must be prepared to fill the role assigned to her, *plus* helping to shape the picture. In order to get the work that she wants, the practical nurse cannot be passive. She must help to develop her own role.

Training for the practical nurse should be designed to prepare her to fit into a wider field; to fulfill an important role. With experience and understanding, she will be able to appreciate the work of the other disciplines. Without it, her role will be less desirable. If she knows and understands other roles and jobs, she can come nearer to obtaining her own goal.

APPENDIX

DEFINITIONS[1]

antiseptic. An agent that prevents or retards the growth of microorganisms.

carrier. An infected person who harbors a specific infectious agent without having the disease clinically but who has the potential of infecting others.

chemoprophylaxis. The administration of drugs including antibiotics to prevent the development of infection into a clinical disease.

cleaning. The removal of infectious material from a surface by scrubbing and washing.

communicable disease. An illness due to a specific infectious agent that arises through transmission directly or indirectly from an infected host.

communicable period. The time during which an infectious agent may be directly or indirectly transferred to a new host.

contact. A person or animal who has been in association with an infected person or carrier so as to have adequate opportunity to acquire infection.

contamination. The presence of an infectious agent on a particular body or surface.

disinfectant. Any agent, usually a chemical, that kills pathogenic microorganisms. It generally applies to preparations intended for use on inanimate objects.

disinfection. The killing of infectious agents (pathogenic microorganisms) outside the body by direct application of physical or chemical means.

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[1] The definitions agree with those given in *Control of Communicable Diseases in Man* (10th ed., New York: American Public Health Association, 1965).

endemic. The habitual presence of a disease within a given geographical area.

epidemic. The occurrence in a region of a group of similar illnesses that are clearly in excess of normal expectancy and derived from a common source.

fatality rate. An expression of the severity of disease as determined by the frequency of death among those persons having the disease.

fumigation. The killing of animal forms by use of gaseous agents.

health education. The process by which individuals and groups of people are taught to promote, maintain, or restore health.

host. A man or living animal affording, under natural conditions, subsistence or lodgment for an infectious agent.

immune person. One who possesses specific protection in the form of antibodies or cellular immunity as a result of previous experience with an infectious agent.

inapparent infection. The presence of infection in a host without clinical symptoms of the disease.

incidence. A general term used to indicate the frequency of occurrence of infection or disease over a period of time in relation to a given population.

incubation period. The time interval between exposure of a susceptible person and the appearance of symptoms of the disease.

infectious agent. An organism capable of producing infection or infectious disease.

infectious disease. A disease resulting from infection.

insecticide. Any chemical used for the destruction of insects (arthropods).

isolation. The separation of infected persons from other persons to prevent the direct or indirect transmission of disease.

morbidity rate. A general term used to express the number of sick persons in relation to the exposed population.

mortality rate. A general term indicating the frequency of death over a period of time in a given population.

pathogenicity. The capacity of an infectious agent to cause disease in a susceptible host.

prevalence. A general term used to indicate the frequency of a disease at a particular time in a given population group.

personal hygiene. Those protective measures primarily applied to an individual to promote health and limit the spread of infectious disease.

prophylaxis. Physical or chemical means necessary to prevent disease.

quarantine. The limitation of movement of well individuals to prevent or limit transmission of infectious disease.

repellent. A chemical applied to the skin or clothing to discourage insects from lighting on and biting an individual.

report of disease. Official notification to appropriate authority of the occurrence of communicable diseases, in man or animal. Diseases in man are reported to the local health authority; in animals, to the livestock, sanitary, or agricultural authority.

reservoir of infectious agents. Animals, plants, or soil in which an infectious agent lives and multiplies so that it can be transmitted to a susceptible host.

resistance. The whole of body mechanisms impeding the progress of infectious agents in a susceptible host.

rodenticide. A chemical used for destruction of rodents, generally through ingestion.

sanitization. The process of making objects free from pathogenic organisms and esthetically clean as far as organic material (saliva, mucus, and feces) is concerned.

sanitize. To reduce bacteria count to a safe level and destroy pathogenic organisms.

source of infection. The person, object, or substance from which an infectious agent passes directly to a new host.

sterilization. The process of destroying all living organisms in or on an object. It must be adequate to kill bacterial spores.

susceptible person. One not possessing adequate resistance to prevent a given infectious agent from producing clinical disease once exposure occurs.

suspect. A person whose medical history and symptoms suggest that he may have a communicable disease.

zoonosis. An infection transmissable from animals to man.

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VOLUNTARY HEALTH AGENCIES

Listed are the national headquarters for 27 voluntary health agencies. Many have local or state offices.

American Cancer Society, 219 E. 42nd St., New York, N.Y., 10017.

American Diabetics Association, 1 E. 45th St., New York, N.Y., 10017.

American Foundation for the Blind, 15 W. 16th St., New York, N.Y., 10011.

American Hearing Society, 1800 H St., N.W., Washington, D.C., 2006.

American Heart Association, Inc., 44 E. 23rd St., New York, N.Y., 10015.

American National Red Cross, 17th and D Streets, N.W., Washington, D.C., 2006.

American Social Health Association, 1790 Broadway, New York, N.Y., 10019.

Arthritis and Rheumatism Foundation, 23 W. 45th St., New York, N.Y., 10036.

Child Study Association of America, 132 E. 74th St., New York, N.Y., 10021.

Child Welfare League of America, 345 E. 46th St., New York, N.Y., 10017.

Maternity Center Association, 48 E. 72nd St., New York, N.Y., 10028.

Muscular Dystrophy Association of America, Inc., 1790 Broadway, New York, N.Y., 10019.

National Association for Mental Health, Inc., 10 Columbus Circle, New York, N.Y., 10019.

National Council on Alcoholism, New York Academy of Medicine Building, 2 E. 103rd St., New York, N.Y., 10029.

National Cystic Fibrosis Research Foundation, 521 Fifth Ave., New York, N.Y., 10017.

National Epilepsy League, 130 North Wells Street, Chicago, Ill., 60606.

National Foundation, 800 Second Ave., New York, N.Y., 10017.

National Health Council, 1790 Broadway, New York, N.Y., 10019

National Hemophilia Foundation, 175 Fifth Ave., New York, N.Y., 10010.

National Multiple Sclerosis National Society, 257 Fourth Ave., New York, N.Y., 10017.

National Safety Council, 425 North Michigan Ave., Chicago, Ill., 60611.

National Society for Crippled Children and Adults, Inc., 11 S. LaSalle St., Chicago, Ill., 60603.

National Society for the Prevention of Blindness, 1790 Broadway, New York, N.Y., 10019.

National Tuberculosis Association, 1790 Broadway, New York, N.Y., 10019.

Planned Parenthood Federation of America, 501 Madison Ave., New York, N.Y., 10022.

Rutgers Center of Alcohol Studies, Rutgers University, New Brunswick, N.J., 08903.

United Cerebral Palsy Association, Inc., 369 Lexington Ave., New York, N.Y., 10017.

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